TECHNOLOGY DEPT.

Gas Journal

Vol. 274. 105th Year. LONDON, APRIL 8, 1953. No. 4688. Price 1/3
Registered as a Newspaper.

APRIL 1951

This photograph shows the foundation work for the Intermittent Vertical Chamber Oven plant at Leeds.

PUBLIC LIBRARY
APR 24 '53
DETROIT

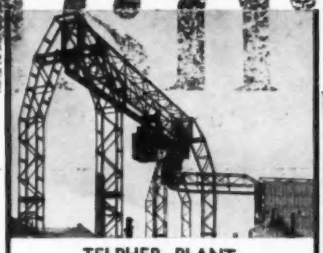
DECEMBER 1952

Photograph of completed plant in operation.

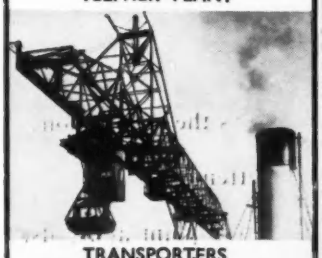
Output is 4,500,000 cubic feet per day.

Jenkins
RETFORD

OF COURSE
WJ ENGINEERS TO THE FUEL INDUSTRIES



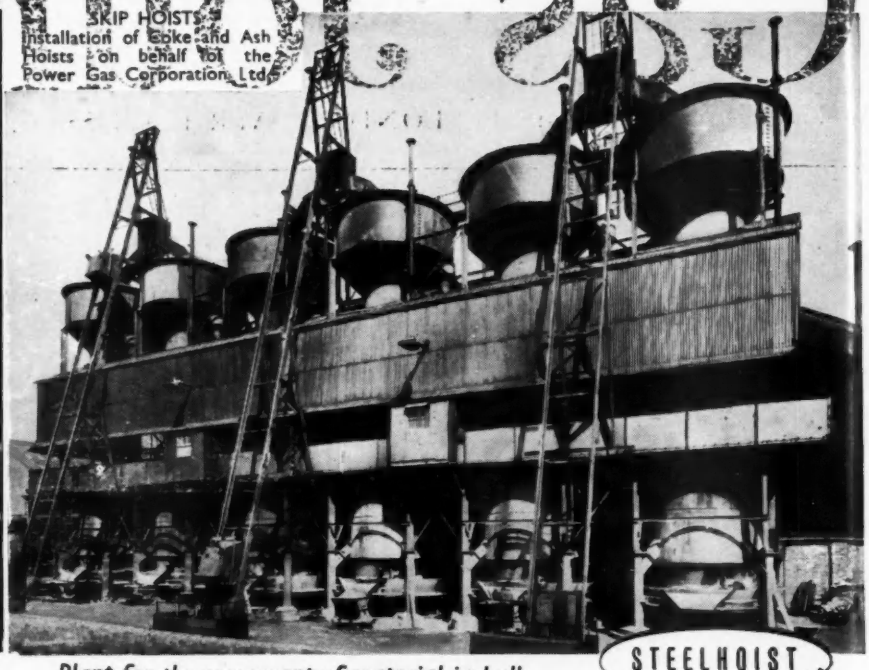
TELPHER PLANT



TRANSPORTERS

WAGON TIPPLERS

SKIP HOISTS
Installation of Coke and Ash Hoists on behalf of the Power Gas Corporation Ltd.



Plant for the movement of material in bulk

STRACHAN & HENSHAW LTD

Steelhoist Works, Bristol 2. Tel: 77664.

STEELHOIST

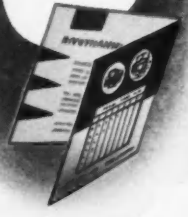
FIG 999

The NEW

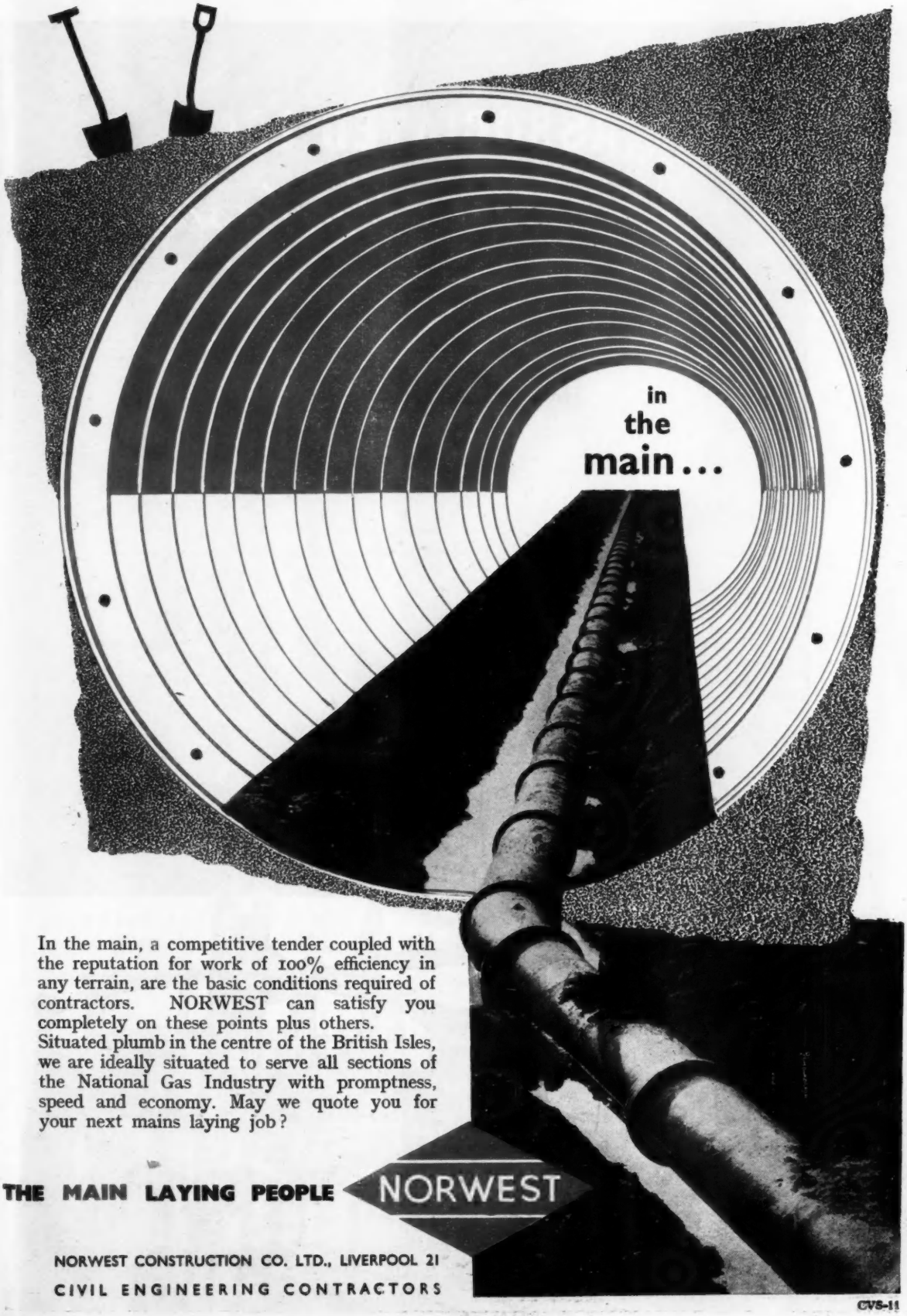
Low Pressure

SERVICE REGULATOR

WRITE FOR FULL SPECIFICATION



THE BRYAN DONKIN COMPANY LIMITED CHESTERFIELD · LONDON · MANCHESTER



In the main, a competitive tender coupled with the reputation for work of 100% efficiency in any terrain, are the basic conditions required of contractors. NORWEST can satisfy you completely on these points plus others.
Situated plumb in the centre of the British Isles, we are ideally situated to serve all sections of the National Gas Industry with promptness, speed and economy. May we quote you for your next mains laying job?

THE MAIN LAYING PEOPLE NORWEST

NORWEST CONSTRUCTION CO. LTD., LIVERPOOL 21
CIVIL ENGINEERING CONTRACTORS

CVS-11

A

ASSOCIATED LEAD
and the Gas Industry

LEAD GAS PIPES • LEAD ALLOY GAS PIPES

WHITE LEAD PAINTS Genuine and Tinted

WHITE LEAD BASE PAINTS Hard Gloss and Oil Gloss

RED LEAD PAINTS • LIQUID RED LEAD

SOLDER • CALCIUM PLUMBATE PAINTS

WHITE OR RED LEAD Ground in Oil

ASSOCIATED LEAD MANUFACTURERS LIMITED

Ibex House, Minories, London, E.C.3 Crescent House, Newcastle Lead Works Lane, Chester
Export enquiries to : The Associated Lead Manufacturers Export Co., Ltd., Ibex House, London, EC3

ASSOCIATED LEAD PRODUCTS

One of a series of advertisements dealing with fundamental features of the

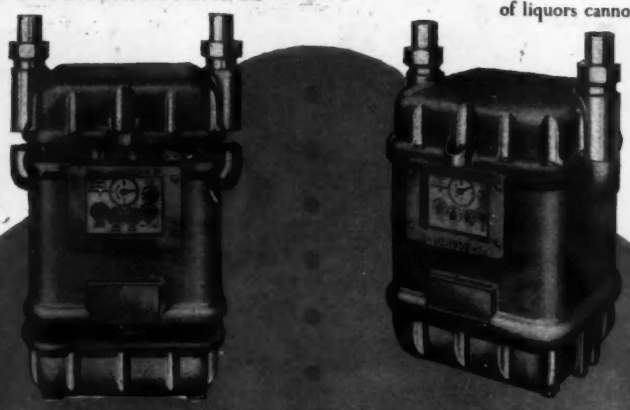
SMITH UNIVERSAL DOMESTIC METER

The design has been based on the introduction unit construction,

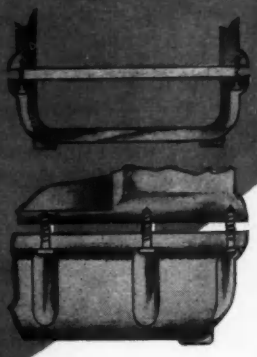
EACH COMPONENT BEING INTERCHANGEABLE

HORIZONTAL SEALING

Strong and rigid die castings in light alloy. All seals are horizontal; draining of liquors cannot attack sealing surfaces.



D E S I G N



BUILT-IN GEAR BOX

The gear box is built in, and a direct drive with the index is sealed from the gas flow.

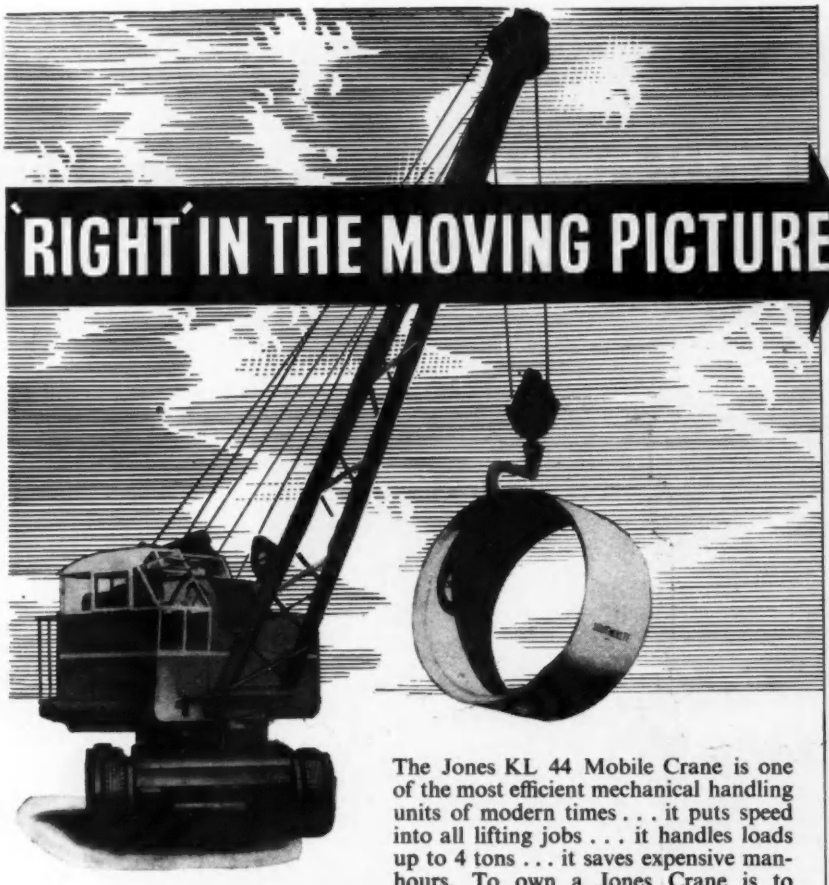
EXTERNAL SEALING

screws are not in contact with the gas flow. Removal of any of these screws does not allow leakage of gas.

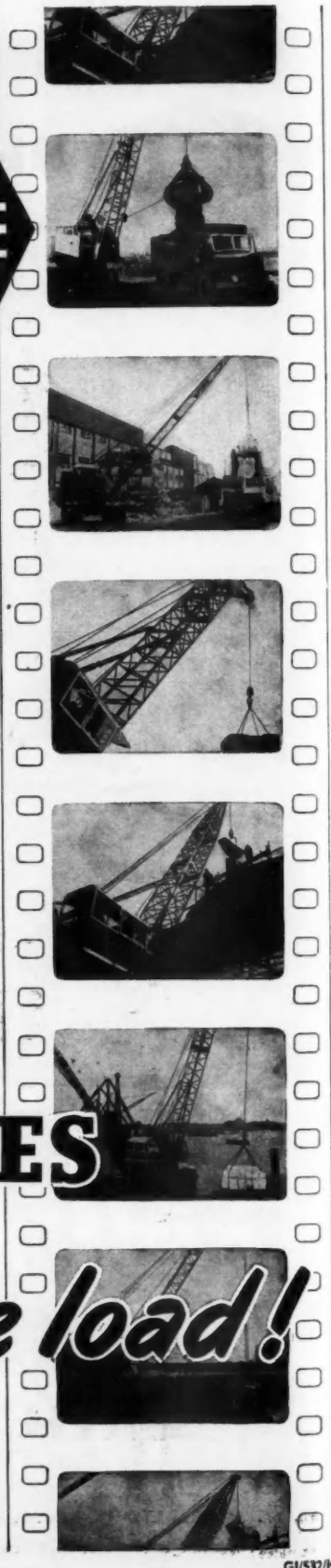
Precision-built in robust, anti-corrosive die casting material, the Smith Universal Domestic Meter meets the demands of all normal domestic loads. Its performance has been thoroughly tested and proved.

SMITH METERS *DOMESTIC AND INDUSTRIAL*

SMITH METERS LTD. 186 Kennington Park Rd., London, S.E.11. Phone: RELiance 2447-8-9. Grams: Smieters, Lamb, London
Works: Kennington, S.E.11 and Streatham Vale, S.W.16. Northern Sales Office: 3-4 East Parade, Leeds, 1. Phone: 23726



'RIGHT' IN THE MOVING PICTURE



The Jones KL 44 Mobile Crane is one of the most efficient mechanical handling units of modern times . . . it puts speed into all lifting jobs . . . it handles loads up to 4 tons . . . it saves expensive man-hours. To own a Jones Crane is to possess a top-performance time and money-saver, ready to go into action instantly and in a hundred different ways. Jones KL Mobile Cranes can go anywhere . . . they are easy to operate . . . are designed for the safety and comfort of drivers . . . they can be supplied with a wide variety of jibs, grabs and other special equipment. And they are backed by the unique Jones KL guarantee and '4-point' service. Let us know your handling problems *now*—it is almost certain that a Jones Crane can solve them.

JONES KL CRANES take the load!

The range includes: **KL 15**—*for loads up to 15 cwt.;* **KL22**—*for loads up to 2 tons;* **KL 44**—*for loads up to 4 tons;* **KL 66**—*for loads up to 6 tons;* **KL 100 Rail Crane**—*for loads up to 5 tons.*

Write for full details.

THE 600 GROUP

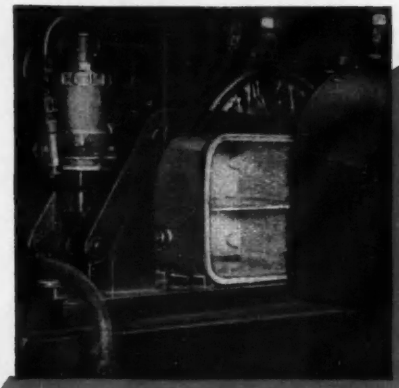
Distributed in the United Kingdom by: **GEORGE COHEN SONS & COMPANY LTD** WOOD LANE · LONDON · W.12 Designed, Manufactured and Exported by their Associates: **K & L STEELFOUNDERS & ENGINEERS LTD** · LETCHWORTH · HERTS

GJ/532/J42

One of a series of advertisements dealing with fundamental features of the

SMITH UNIVERSAL DOMESTIC METER

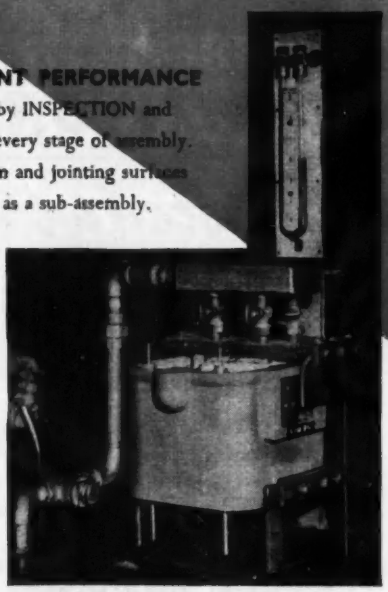
ALL SEALING SURFACES are machined to very close limits for dimensional control and finish. The illustration shows both top and bottom surfaces of the body casting being machined in one pass.

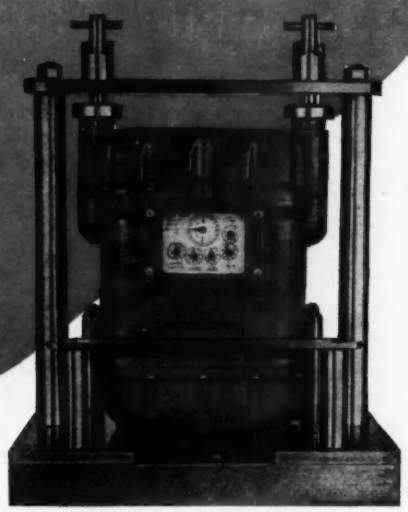


BOSSES are formed and machined from the solid casting, so ensuring the UTMOST RIGIDITY IN DESIGN and the close control of thread dimensions and centres.

P R E C I S I O N

CONSISTENT PERFORMANCE is controlled by INSPECTION and TESTING at every stage of assembly. The diaphragm and jointing surfaces are 'sounded' as a sub-assembly.





FINAL GAUGING in a universal receiver ensures that overall dimensional accuracy is maintained.

(In accordance with the I.G.E. Specification No. 319)

SMITH METERS *DOMESTIC AND INDUSTRIAL*

SMITH METERS LTD. 186 Kennington Park Rd., London, S.E.11. Phone: RELiance 2447-8-9. Grams: Smieters, Lamb, London
Works: Kennington, S.E.11 and Streatham Vale, S.W.16. Northern Sales Office: 3-4 East Parade, Leeds, 1. Phone: 23726

JETS or NOZZLES...

-call them what you will

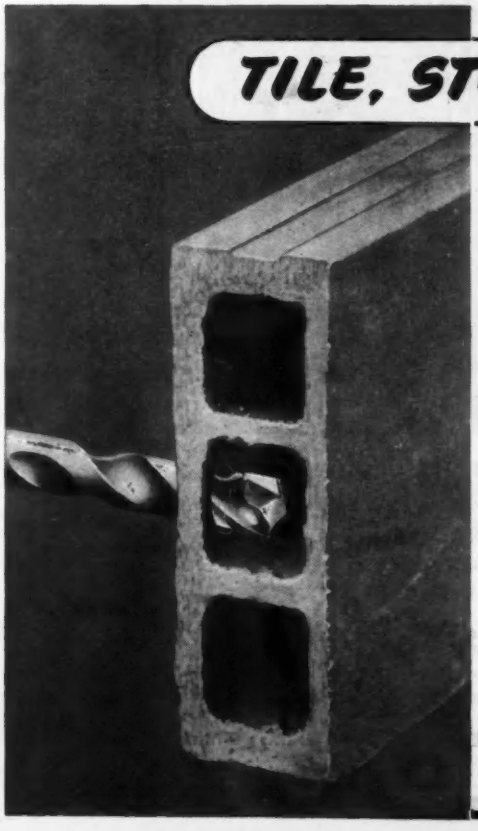
. . . . we are specialists in their manufacture and can make them to any specification from ·008" to 1" orifice in any metal.

In addition to the Gas Industry some of the other trades for which we manufacture are the Aircraft Industry, the Motor Industry, Paint Spraying, Crop Spraying, Sand Blasting, Bottle Washing Machinery, etc.

Maybe you have a problem Jet or Nozzle—why not let us quote you? Send for full details to:

POLLOCK & PEEL *Limited* ENGINEERS

SOUTH END, CROYDON, SURREY. Tel: CROydon 3158/9



TILE, STONE or CAVITY BRICK

Drill Faster with
RAWLPLUG
DURIUM (REGD)
TIPPED DRILLS

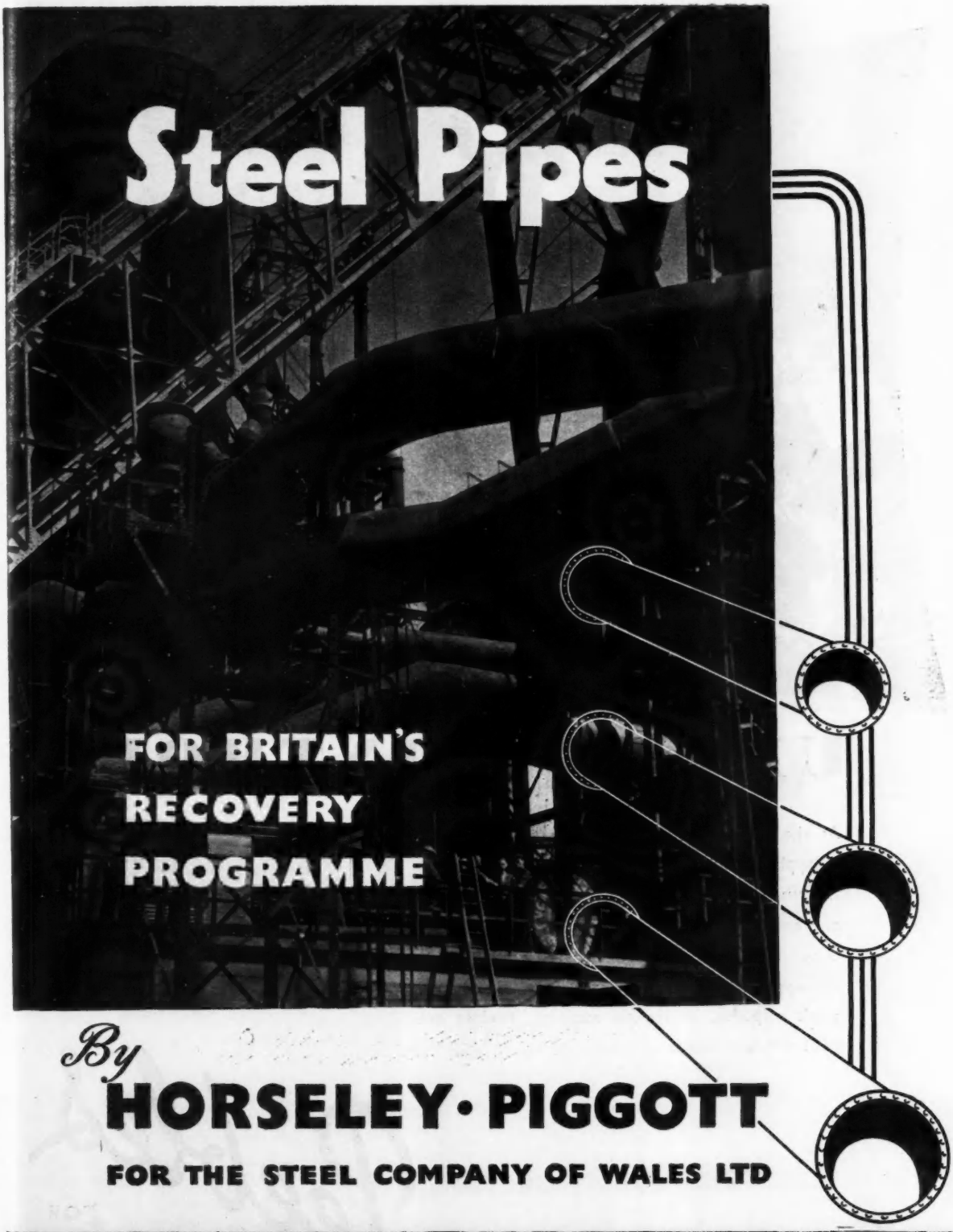
Look how this Durium-tipped Drill is working almost at the edge of the pot—*without fracture!* This sharp, clean-cutting quality of Durium-tipped Drills makes them specially valuable for many a tricky cavity job, quite apart from their extraordinary speed and silence in operation.

Durium-tipped Drills are made in all Rawlplug sizes from No. 6 to 30, in Rawlbolt sizes C. D. E. & G., and in the long series for drilling through walls. Look for the special inset Durium tip, and for the name DURIUM on the shank. Almost diamond-hard. *No other is a genuine Durium Drill.*

Free literature gladly sent on request—write today.

Durium-tipped—that's the point!

THE RAWLPLUG CO. LTD • CROMWELL RD • LONDON, • SW7



By
HORSELEY · PIGGOTT
FOR THE STEEL COMPANY OF WALES LTD

HORSELEY BRIDGE AND THOMAS PIGGOTT LTD
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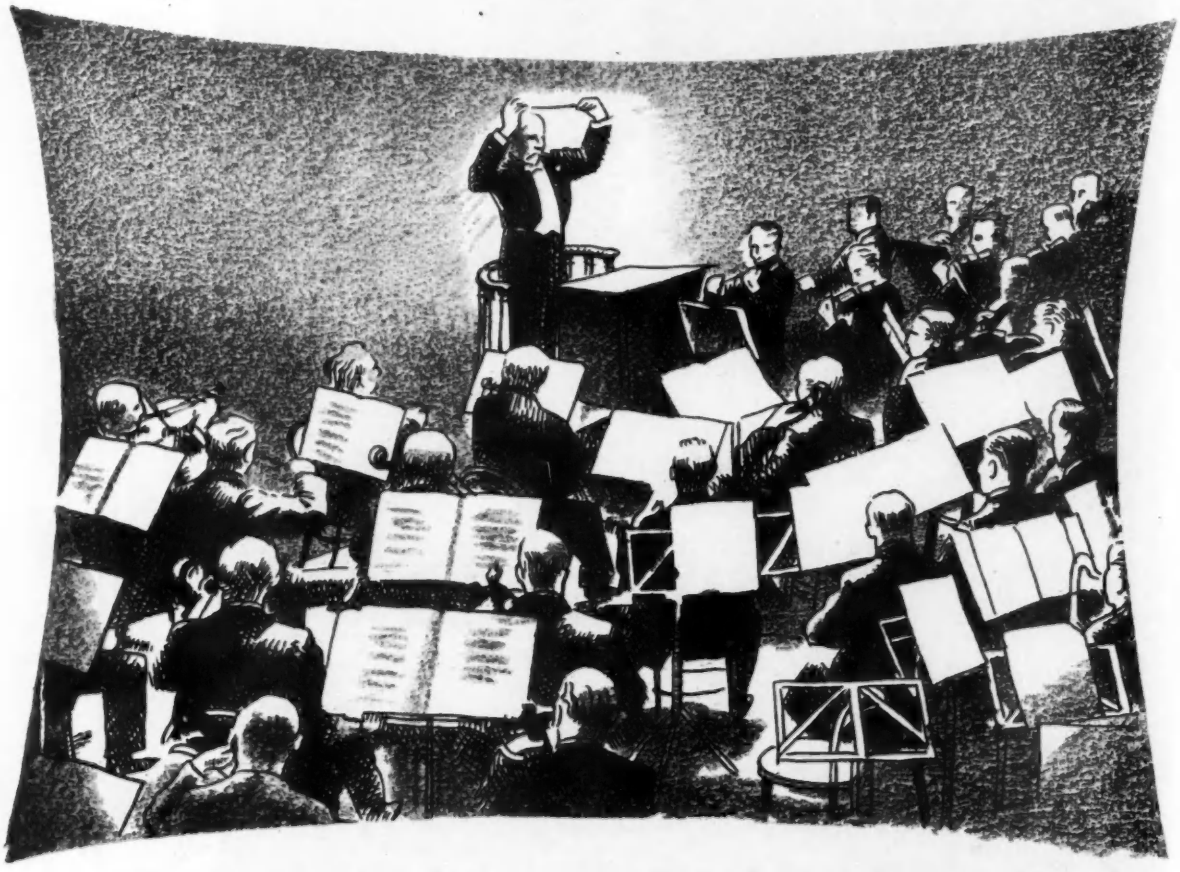
UNDER CONTROL

As the last note dies away, there is an outburst of applause—applause first for the conductor, for the way in which he welded the musicians into one entity by his MASTERLY CONTROL. Peebles Governors gain appreciation for those same qualities—precise, positive and CONSTANT control, quick response, meticulous accuracy. Peebles are BEST for Governors.

Peebles

FOR GOVERNORS

PEEBLES & CO. LTD., TAY WORKS, WEST BOWLING GREEN ST., EDINBURGH 6

Telephones: 36544 & 33069 Telegrams: "TANGENT, EDINBURGH"

TY-ROCK

consistent screening of product at all feed rates

BIF STAND NUMBER D617/516 BIRMINGHAM

- Full-floating, balanced mechanical screen with vibrating body mounted on rubber.
- Self-adjusting to varying loads.
- No movement transmitted to base frame. Bearings thus have a longer life.
- Circle-throw operation gives great screening efficiency.

Ty-rock Screens are made in a range of sizes for wet or dry screening —one, two or three decks. Write for full details :

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INTERNATIONAL COMBUSTION LTD

London Office : Nineteen Woburn Place, W.C.1

WORKS : DERBY, ENGLAND ; PORT ELIZABETH, SOUTH AFRICA ; SYDNEY, AUSTRALIA

SERVICE

FOR THE GAS INDUSTRY

HARDMAN & HOLDEN LIMITED

INCORPORATING MANCHESTER OXIDE CO LTD

MANOX HOUSE · MILES PLATTING · MANCHESTER · 10

TELEPHONES: COLLYHURST 1581 (21 LINES) • TELEGRAMS: OXIDE MANCHESTER

getting to grips . . .

In tackling any job, the quicker one gets to grips with the problem the quicker the job is done.

Talking of grips reminds us, we stock a complete range of wrenches, spanners and pliers . . .

You can also get to grips with the problem of obtaining the right tools and equipment easily . . . we carry a complete range for the needs of the Gas Industry.

ABBOTT, BIRKS & CO LTD

COMPLETE TOOL AND EQUIPMENT SERVICE TO THE GAS INDUSTRY

ABBIRKO HOUSE, 90-91 BLACKFRIARS RD., LONDON, S.E.1. *Tel: WATerloo 4066 (4 lines)* *Grams: Abbirko, Sedist, London*
Rooster 2646

What OXYGEN Hand Cutting can do—

Making...

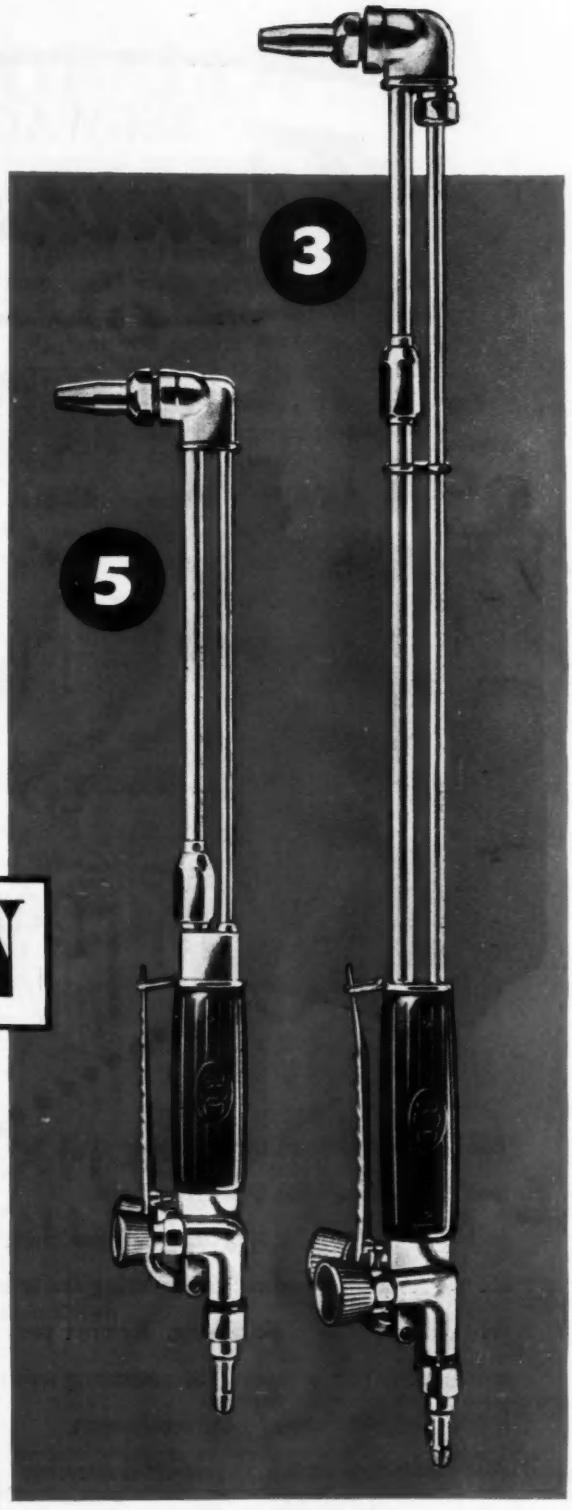
The Cutogen Blowpipe is now universally used for rapid cutting of iron and steel in a great many applications. These include shaping heavy plates for engine frames, bed plates, etc., profiling heavy sections for use in place of expensive forgings, for girder cutting, gouging and weld removal. It is an accepted tool for all constructional cutting. The clean, accurate cuts achieved make for easier fabrication.

Breaking...

The capacity and versatility of the Cutogen hand cutter makes it indispensable on all scrap cutting and breaking operations—such as the breaking-up of 10" thick armour plate on H.M.S. Warspite shown here.

BOC DESIGNED AND MADE PERFECT BY

—and the B·O·C EQUIPMENT to do it!



Cutogen 5

1 A robust Cutter. Cuts 12 ins. mild steel and 4 in. cast iron.
2 Quick-action ball ended valves with large size control knobs.
3 Lever cutting control "off" when released.
4 Valve body and nozzle head from hot brass stampings. Nozzle head internally threaded.
5 Anti-spatter nozzles.
6 Positive colour identification and non-interchangeable threads for gas connections.

STANDARD MODELS
18" with 90° HEAD 24" with 75° HEAD (18" model also available)
Also available to order with longer shanks in increments of 6 ins. Chromium plated—not for eye appeal—but for sound service. The smooth, hard-plated surfaces are spatter free.

CUTOGEN

With their accurate one-piece nozzle and finger-tip control of fuel gas and oxygen, Cutogen Blowpipes are the lightest, strongest and easiest-to-use of all oxygen cutters. Wherever there's iron or steel to be cut—remember CUTOGEN.

Cutogen 3

Similar specifications to Cutogen 5 but of larger capacity to handle the heaviest hand cutting work.
Standard length 27 ins. between centre lines of cutting nozzle and control valves. Obtainable in greater shank lengths by increments of 6 ins.
Top tube is stainless steel to give rigidity to the increased shank length necessary for comfortable operation.
Cuts 20 ins. mild steel
Cuts 15 ins. cast iron

Other Cutogen Blowpipes are available as follows:—
Cutogen 6 for Powder Cutting
Cutogen 7 for Powder Washing
Cutogen 8 for Deseaming

Write for full particulars to your B.O.C. Branch

THE BRITISH OXYGEN CO LTD LONDON & BRANCHES

BEGWACO

Flomaster

Three sides to the two-part case

Look at both sides of the Flomaster's neat case—then undo five screws only and look inside. This simplicity and fine finish are the result of advanced design using the latest methods of pressure die-casting. Remove two more screws and withdraw the measuring unit; it is entirely unchanged—the mechanism that has earned such high praise for unerring accuracy and silent, trouble-free service.

BEGWACO METERS LIMITED · QUEEN STREET · FARNWORTH · LANCS

MONEY FOR JAM?

How much of each £1 you spend in wages goes to pay for unproductive humping and heaving, unnecessary movement, avoidable fatigue and hold-ups? If you could get accurate costings you might be in for a shock.

Sometimes impressive savings come from quite a small investment in expertly planned handling gear. A sound installation soon pays for itself and goes on saving year in year out.

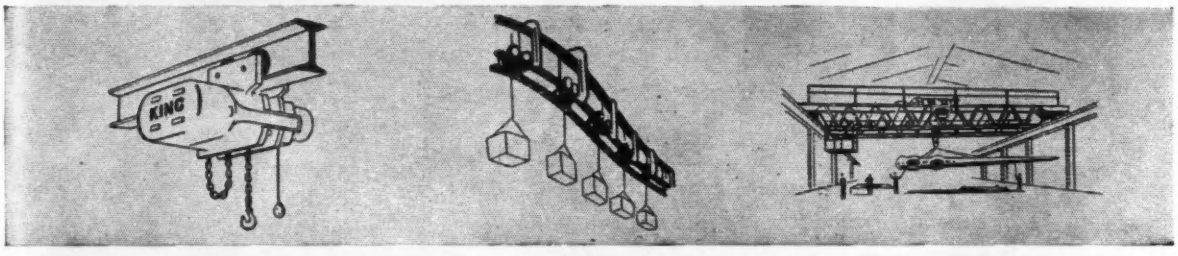
If it sounds like money for jam, remember this; *you're paying for a modern installation whether you have it or not!*

You will find many money-saving ideas in KING booklets. A preliminary consultation with a planning engineer from Geo. W. King Ltd. costs you nothing. Why not see what we can do for you? There is no obligation except ours — to help you speed output and lower costs.

KING
REGISTERED TRADE MARK

PULLEY BLOCKS · CRANES · CONVEYORS

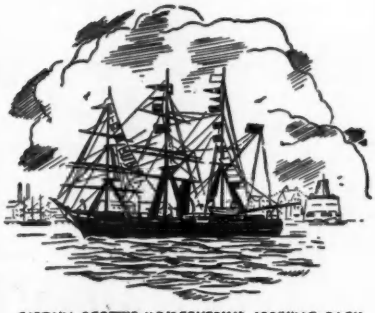
WRITE FOR ILLUSTRATED BOOKLETS TO GEO. W. KING LTD., 25 WORKS, HITCHIN, HERTS. TELEPHONE: HITCHIN 960. AND AT STEVENAGE



1904

PAXMAN BOILER

installed at Colcent Laundry Ashby-de-la Zouch.



CAPTAIN SCOTT'S "DISCOVERY" ARRIVING BACK FROM THE FIRST POLAR REGIONS EXPEDITION IN 1904

This Paxman Boiler which was installed in the same year that Scott returned from his first Antarctic Expedition is still giving trouble-free operation. Similar service can be expected from the three types of boiler manufactured by us to-day.

ECONOMIC · ULTRANOMIC · ALL STEEL SECTIONAL

Write for full details and let us advise you on your steam and heating problems.

DAVEY, PAXMAN & CO. LTD. COLCHESTER

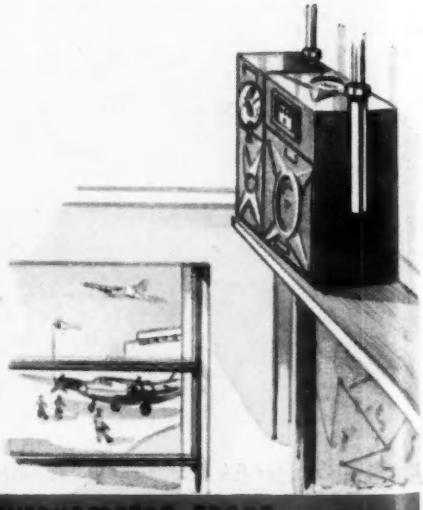
Telephone: COLCHESTER 51517 *Telegrams: PAXMAN COLCHESTER*

Paxman

B 35

Whatever the attraction, a new liner, or meeting a good friend at the airport, in some unseen corner—close at hand —a gas meter is carrying out its life long task. Often it's a Wilson.

ONE OF BRITAIN'S BACKROOM BOYS



GEORGE WILSON
GAS METERS LTD.

COVENTRY JARROW LONDON MANCHESTER WOLVERHAMPTON TROON

We've got the cutest 'BABY'!

CUTE BECAUSE IT'S A CLEVER 'BABY'— it can do everything! Cute because it's so good-looking! For all who live in small quarters, the Junior General is the *complete* answer to cooking problems. It can boil and grill, and its versatile quick-heating oven makes baking and roasting easy — note the drop-down door which makes a handy extra shelf. Yet it takes up little more room than a radio set!

Business girls, bachelors, young couples, retired people — all whose living-space is restricted — welcome this wonderful little model, designed specially to bring better living within their reach. Finished in cream and black enamel, the Junior General embodies the high standards of design and craftsmanship traditional with General Gas Appliances Ltd.

JUNIOR GENERAL GAS COOKER

Made by **GENERAL GAS APPLIANCES LIMITED, AUDENSHAW, MANCHESTER**

(Proprietors: Allied Ironfounders Ltd.)

IS THAT A FACT?

Yes! "One-man" and "One-woman" families in this country now total nearly one-and-a-half million.

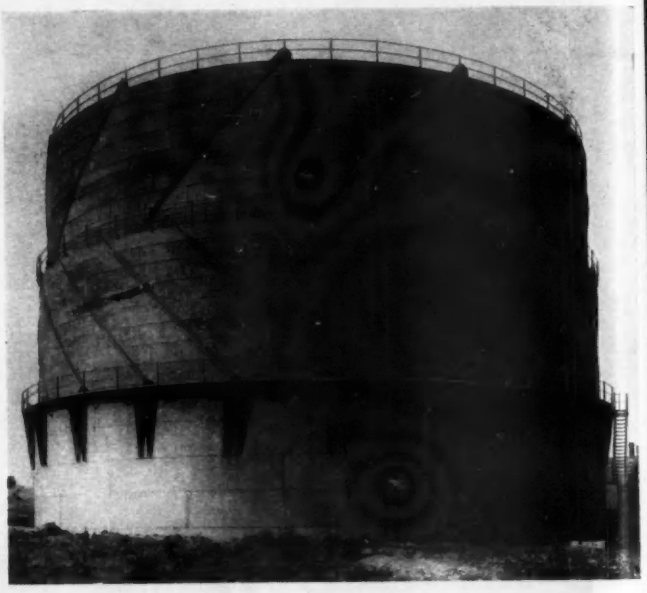
B

for HIGH PRESSURE, COLUMN GUIDED

GASHOLDERS

RIVETTED OR WELDED

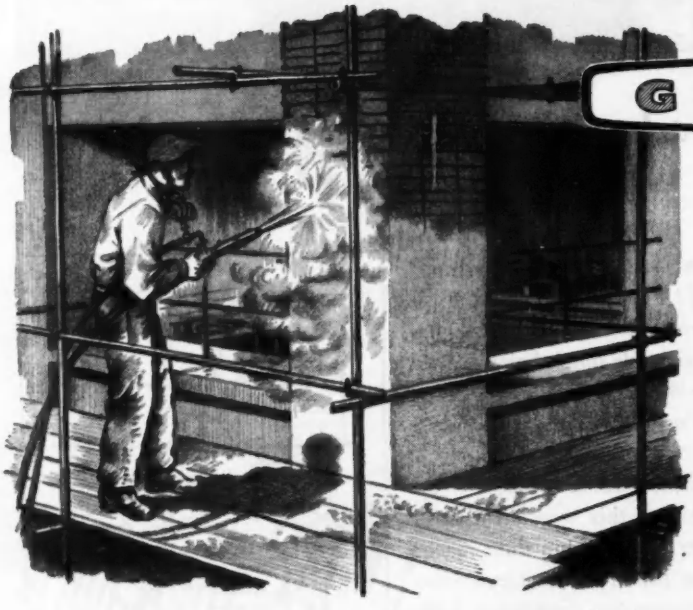
BLAKELEYS



Consult

FIRTH BLAKELEY
SONS & CO LTD
CHURCH FENTON, YORKS

Telephone: BARKSTON ASH 234/5



GUNITE

The successful way to recondition defective concrete structures, encase structural steelwork, and line tunnels and water reservoirs. Developed and applied in all parts of the world with the resources, experience and skill of The Cementation Company, Ltd.

BY THE CEMENTATION Company Limited

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CINTEL
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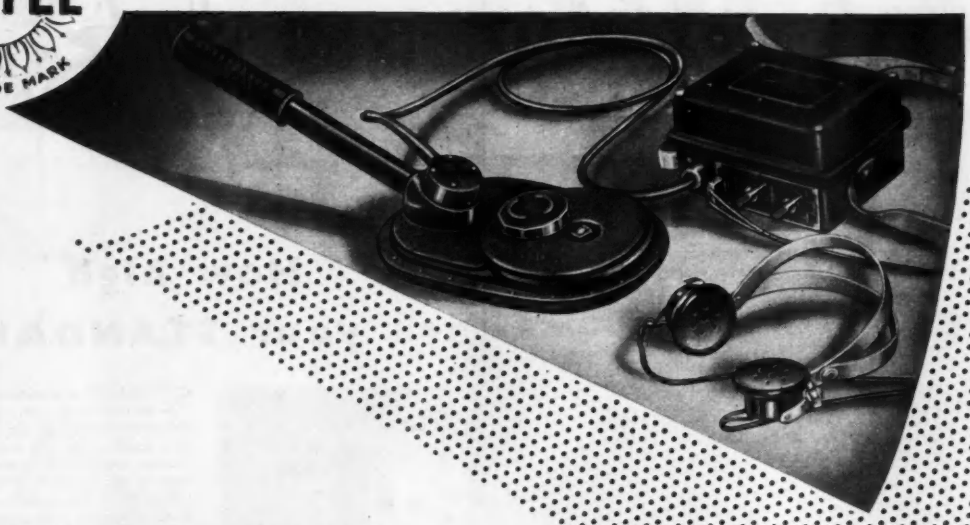

The 'CINTEL' PORTABLE
METAL DETECTOR is
still the best method of locating stop-cock
boxes, manhole covers, etc., the exact
positions of which are unknown. And with the aid of
an oscillator attachment, pipes buried to a depth of 30 feet
can be easily located and their routes traced.
This instrument is used today by most of the principal gas
and water undertakings in the country and full details
will be sent to you on request.

Cintel

CINEMA-TELEVISION Ltd.
WORSLEY BRIDGE ROAD · LONDON · SE26

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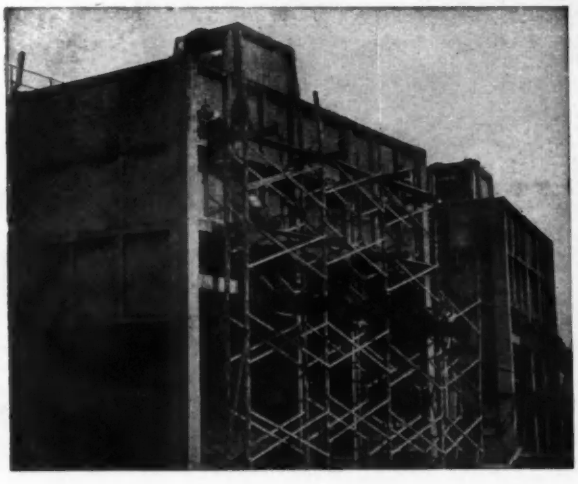

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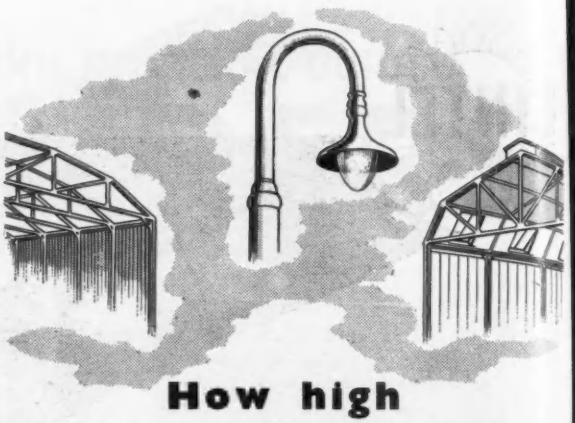

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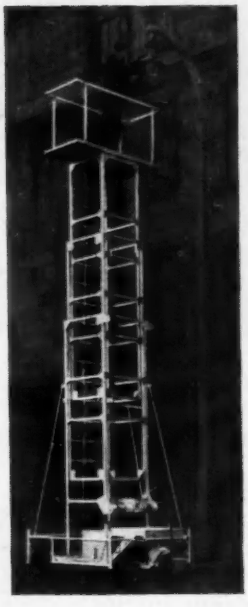

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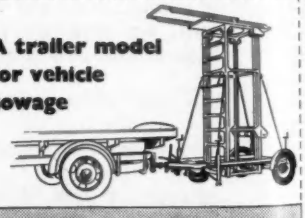

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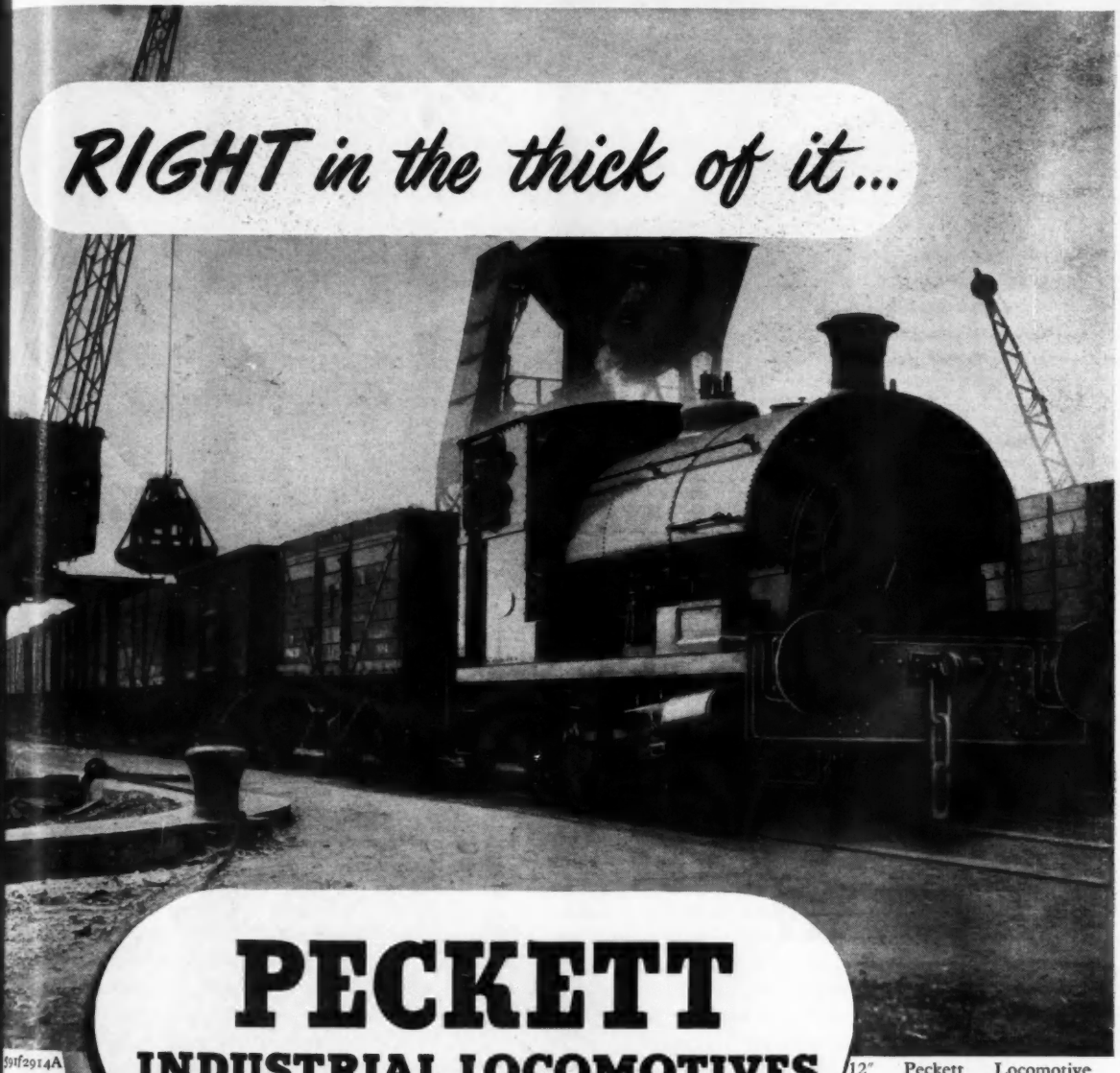

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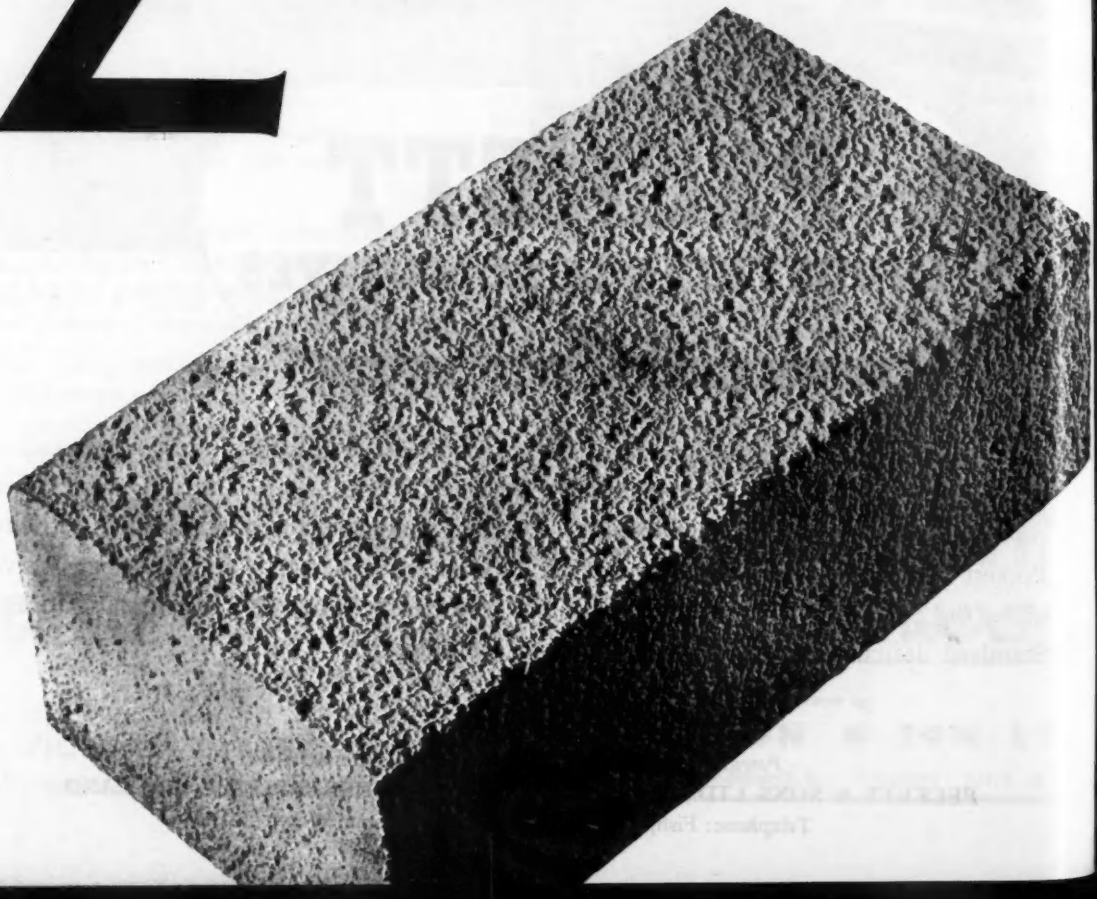

FURNACE MAINTENANCE

✻ THE MORGAN M.R.1

—a brick that carries the ordinary high quality firebrick into entirely new fields of usefulness. It can be used, for example, at temperatures as high as 1600°C—far beyond the capacity of other refractories of similar alumina content. In fact, with these bricks, this standard of comparison is no longer valid. They can be judged only on performance and in that they are comparable only with special purpose refractories having a very high alumina content indeed.

How is it done? The answer is in the way they are made: in the selection and purification of the clay; in the unusually hard burning and careful grading of the grog; above all in the very high temperature of the final firing. The manufacturing process is a continuous one—which in itself makes for uniformity—and it is carried out under rigorous quality control.

All this costs money—but consider what its results mean in practice. Remarkable rigidity up to 1600°C; an after-contraction at this temperature of only 1% (The usual temperature for measuring after-contraction is 1410°C); negligible after-contraction below 1600°C. The bricks are close textured and strong, their resistance to abrasion is high; and they have unusually good resistance to both thermal and physical spalling.

Bricks of this type, although not previously manufactured in this country or in Europe, have been in use for some years in the U.S.A. where they have decisively proved their economy in terms of reduced furnace maintenance.

TYPICAL PROPERTIES OF M.R.1

Approximate Chemical Analysis		
Silica	(SiO_2)	52/53%
Alumina	(Al_2O_3)	43/44%
Iron Oxide	(Fe_2O_3)	less than 1%
Titanium Oxide	(TiO_2)	less than 1%
Magnesia	(MgO)	less than 2%
Lime	(CaO)	
Potash	(K_2O)	
Soda	(Na_2O)	

Physical Characteristics	
Refractoriness ...	Cone 35 (1770°C)
Refractoriness under load (25 lb./sq.in.):	
Commencement of subsidence	1600°C:
10% subsidence	1700°C
Bulk density ...	132 — 137 lb./cu.ft.
After-contraction (2 hrs. 1600°C)	less than 1.0%
Thermal expansion ...	4/5 x 10-6 per °C.

e th whole conception of furnace maintenance and efficiency

✻ THE MORGAN LOW STORAGE REFRACTORY M.I.28

—a brick that can double furnace output. It is a hot-face insulating refractory which can be used at furnace (or interface) temperatures up to 2800°F (1538°C).

At these temperatures it has a lower conductivity than any other type of refractory; and therefore provides a greater reduction in the convection and radiation losses from the outside of the furnace. But that is less than half the story: even more important is the reduction in heat storage. The M.I.28 is little more than a third of the weight of an ordinary refractory; consequently only a third of the heat is required to raise the whole of it to the same temperature. But, with the same furnace temperature, the average temperature of an M.I.28 is much lower (owing to its lower conductivity) and this still further reduces the heat it takes up. With the same heat input, therefore, furnaces built from M.I.28 bricks heat up rapidly: on batch furnaces this can amount to a doubling of the furnace output—to say nothing of the saving in fuel. Low conductivity also has a bearing on the effective strength of the brick. For, even when working at high face temperatures, the greater part of the brick is relatively cool. Not only this but their light weight reduces the load on the lower courses and, incidentally, the weight of the whole furnace structure.

There have been hot-face refractories before. What, then, is new about the M.I.28? In theory nothing. Again it is a matter of the way they are made. Morgans have put the whole of the theory into practice. The plant is entirely new in design and operates under rigorous quality control from the purification of the clay to the final grinding to size.

As in the case of the M.R.1, bricks of this quality have been available for some years in the U.S.A. and the improvements they can make in furnace efficiency have been firmly established.

TYPICAL PROPERTIES OF M.I.28

Maximum Service Temperature		1538°C (2800°F)
Thermal Conductivity:		
Mean Temperature	538°C (1000°F)	2.4 B.Th.U/hr.(sq.ft.)(in.)°F)
	816°C (1500°F)	2.9 B.Th.U/hr.(sq.ft.)(in.)°F)
Bulk Density		47.5 lb./cubic ft.
Refractoriness		1710°C (3110°F)
Modulus of Rupture		greater than 120 lb./sq.in.
Heat Capacity Factor		0.105

(the ratio of the heat stored in a M.I.28 furnace wall relative to that stored in a firebrick wall of the same area, and of a thickness giving similar hot and cold face temperatures)

MORGAN refractories ARE WORTH FAR MORE THAN THEY COST

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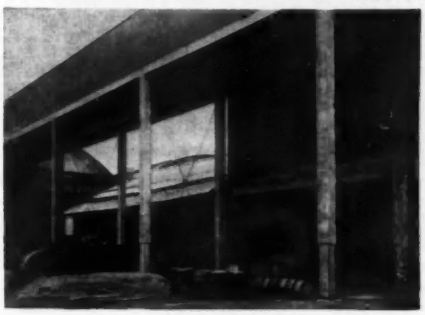

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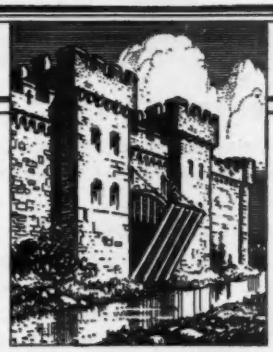

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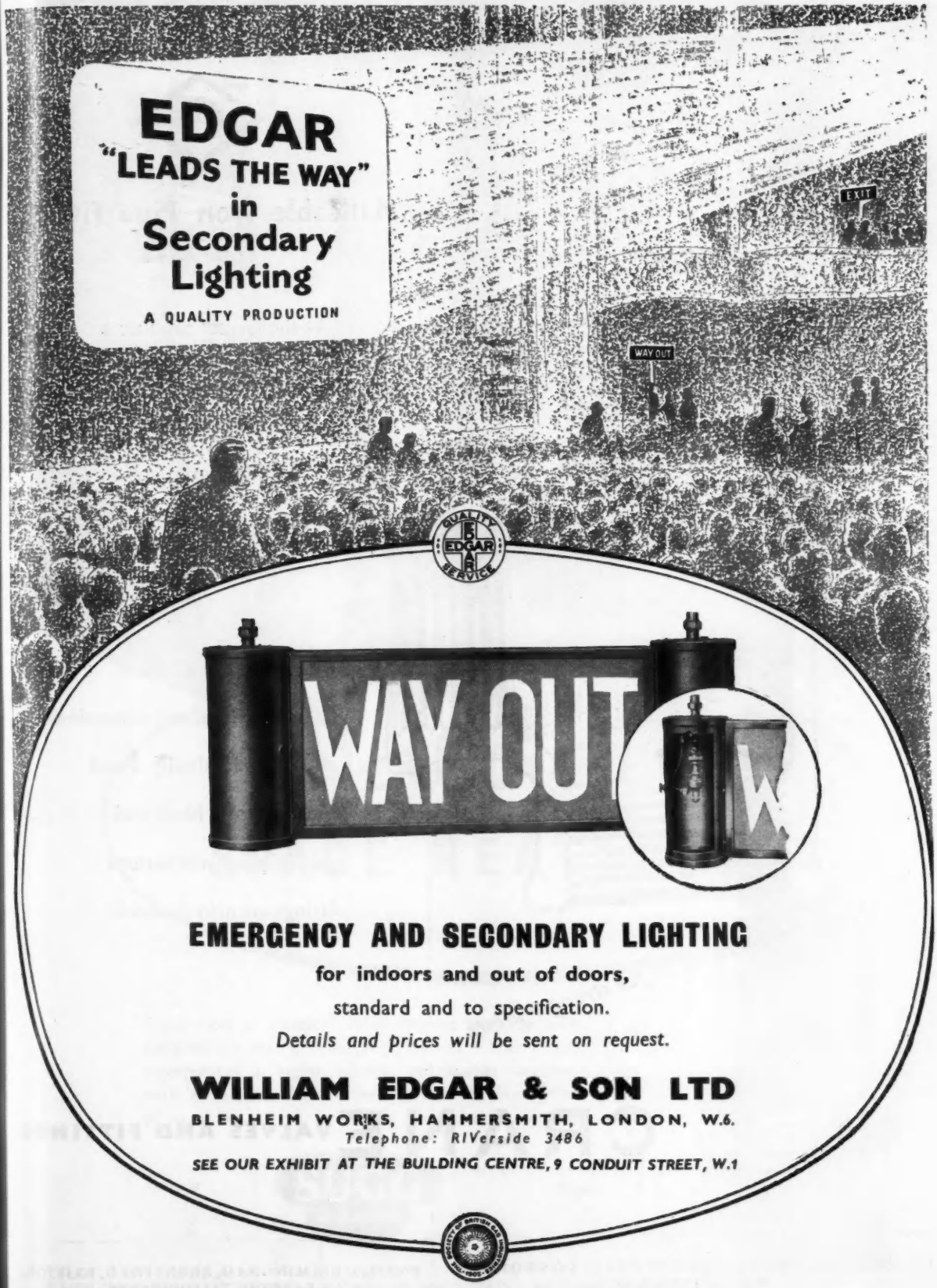

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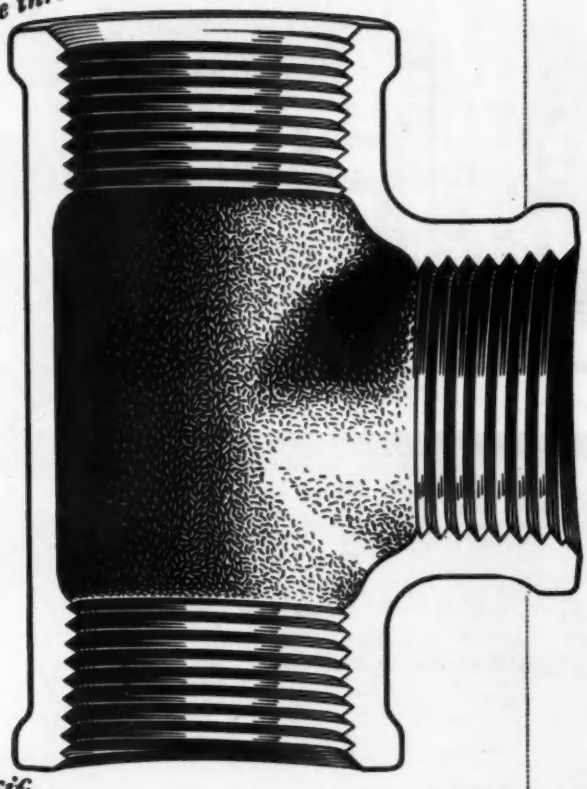

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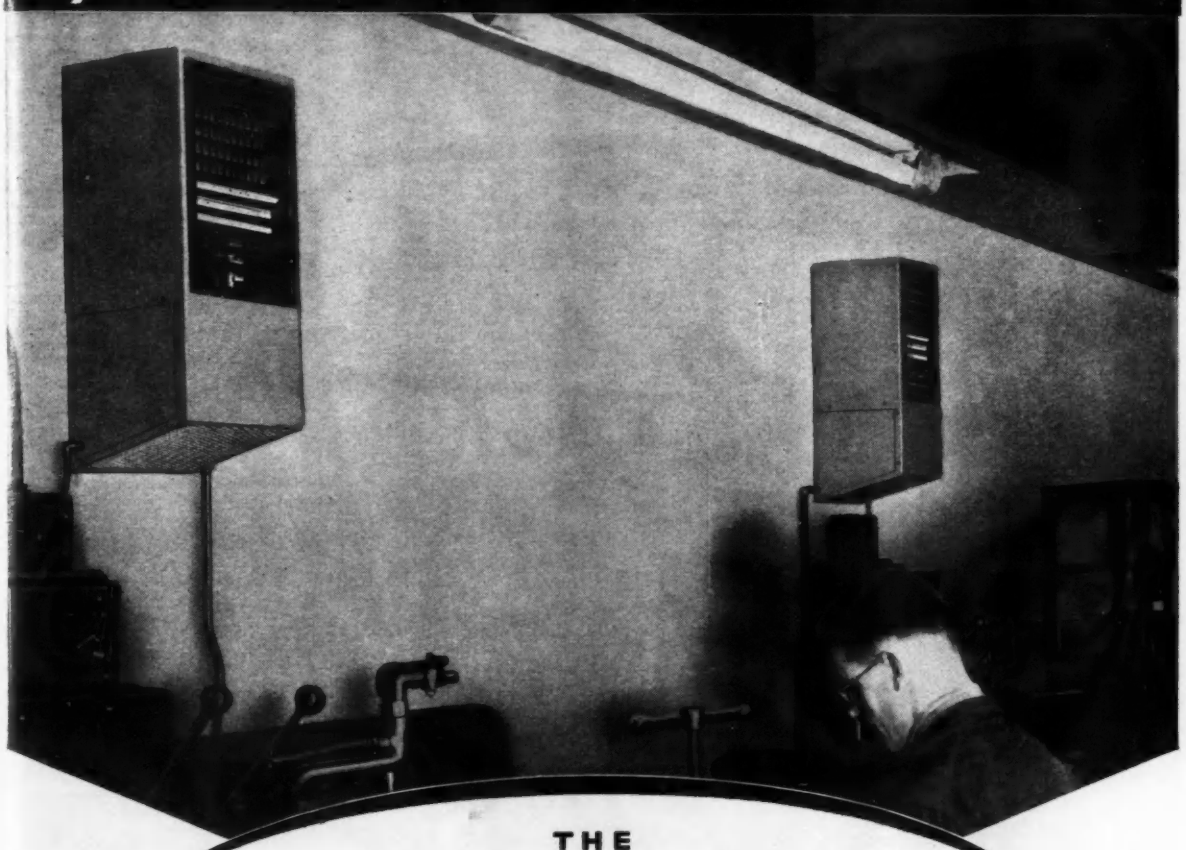

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GAS JOURNAL

VOL. 274. No. 4688 105TH YEAR APRIL 8, 1953

THE GAS TURBINE AND FUEL EFFICIENCY

WE regret that considerations of space prevent us from publishing a complete translation of the excellent paper by M. Chambadal, referred to in our feature 'Gas in France,' with its admirable diagrams. The advent of the gas turbine was greeted in some quarters with expectations which have not as yet been realised. It was hoped that the application of combustion direct to the prime mover, cutting out the losses inherent in the steam cycle, would result in a great increase of thermal efficiency. The facts are that in the first place the temperature of the products of combustion which can be allowed to enter the turbine are limited by the heat-resisting properties of available alloy steels and in the second place a fairly large proportion of the power developed in the turbine must be absorbed in the compression of the working fluid. The thermal efficiency of the simple cycle, combustion chamber, compressor, turbine and dynamo, is no more than 18%, but by various complications and recuperations efficiency can be brought up to, say, 30%.

As in the case of the steam turbine, overall thermal efficiency can be still further increased if use can be made of the residual heat in the working fluid when it leaves the power unit. To take advantage of this, power generation must be combined with heat supply, whether in the form of process steam or that of space heating. In the steam cycle the pass-out turbine provides a combined power and heat supply which is simple and relatively cheap though the output of electricity is considerably reduced. But as M. Chambadal points out, its obvious disadvantage is lack of flexibility. It can only function efficiently when the demands for power and for heat correspond in their variations pretty closely and, it may be added, where the locations to be heated or supplied with process steam are pretty near to the power station.

This is quite an exceptional circumstance and, as it is fully recognised, not likely to fit in with the modern system of giant power stations. Even with power stations of quite moderate dimensions, such as might serve a single factory, difficulties arising out of the non-correspondence of the two demands must require such complications as steam accumulators or the introduction of a condensing turbine to be put into operation as required with, possibly, co-ordination with the public electricity supply system.

M. Chambadal elaborates the view that the advent of the gas turbine has brought a new element, 'a veritable revolution,' into the field of a combined power and heat supply, providing not only a new solution but several solutions of this problem. We have abstracted his lucid descriptions of several of these proposals, some of which have been put into practice. Perhaps the most interesting of these is the combination of the internal combustion engine with the gas turbine. As realised, it is the use of the diesel engine to compress the air which forms the bulk of the working fluid and the products of combustion to supply the heat. It is the mixture of the products of combustion with a portion of the compressed air which forms the working fluid of the turbine. There are no rotating parts in this engine. It consists of two opposed pistons, each with two diameters, the larger taking the explosive force of combustion, and the smaller compressing the indrawn air. We presume that gas could be used as the fuel as well as the diesel oil so far employed. Gas also comes into the picture in the waste heat schemes which are before the industry at the moment in this country.

These waste heat turbines are followed by waste heat boilers generating steam which is to be used in steam turbines and for process work. The author points out that the temperature of the steam thus raised is limited to that of the working fluid leaving the gas turbines. And this leads to another development in the case of the combustion turbine where the oxygen content of the working fluid is still high (because to reduce their temperature to safe limits the products of combustion must be diluted by relatively large volumes of air), so

high that it can be fed as part of the air supply to the combustion chambers of a boiler in which steam can be raised at any desired pressure and temperature.

It is evident, then, that full advantage of these schemes can only be taken where there is a demand for process heat or space heating in immediate proximity to the power station. When the power unit is of large size —size, that is, commensurate with public supply—these conditions can only be realised in combination with district heating. The objections to district heating need not be repeated in full here. Perhaps the most formidable is that for its full development it requires a reversal of the policy of the electricity supply industry, the substitution for a relatively small number of superstations of the condensing type of a large number of smaller local stations with pass-out turbines, improved as these may be by the use of the gas turbines in one or other of the combinations described by M. Chambadal. That would indeed be a major operation—not likely to be even seriously considered until the Ministry of Fuel and Power or the Government itself gets down to a real co-ordination of the public services of heat, power, and transport.

PUBLIC RELATIONS

THE Acton Society Trust, whose non-party, non-profit making, researches into aspects of the nationalised industries over the past two or three years have contributed much to a better understanding of these new features of British enterprise, has left until the last of its series of 12 papers a study of the crucially important subject of relations with the public, a public comprising two more or less clearly defined schools of thought—those who can see no evil in any brand of socialisation, and those who blame the State for every rise in price and every conceivable defect in the service they think they ought to receive. The paper attempts to describe the arrangements set up since nationalisation to foster relations with the public, and to evaluate them as a whole. Some such assessment is long overdue, for both the boards and the public have expressed criticisms of the relations existing at present. The conclusion is reached that one cannot consider the present arrangements designed to maintain the nationalised industries in close relation with the public without forming the impression that some aspects of the conduct of those industries go unstudied and unnoticed and that the possibility exists that much of what the public really thinks and wants is overlooked.

The subject is studied not only from the point of view of the duties of the individuals who hold positions as public relations officers but from the wider aspects of information services, publications, statistics and technical information, exhibitions, etc., and the general flow of information. Incidentally, in a chapter on the annual reports, credit is given to the North Thames and Wales Gas Boards for fuller reports than most of the area boards and for making some attempt to present statistical data in the form of graphs. Due acknowledgment is made of the work performed by the consultative councils often with inadequate finance, but it is said that the reasons why consumers make comparatively few representations to them are that domestic consumers are not yet familiar with the councils, while industrial consumers are able to look after themselves. Some councils have hesitated to publicise themselves for fear of stimulating public demand for services which the boards cannot hope to supply in conditions of capital restriction and other shortages. It is added: 'In reviewing the system on which consumer councils are organised it is difficult to avoid the impression of half-heartedness, even of amateurishness.'

The paper bears evidence of a thorough investigation of a far reaching problem and notes, among other matters, that in the North Thames area the public relations officer has a woman assistant whose job is to maintain contact with women's organisations in the area; and that in regard to the responsibility of public relations officers two main patterns are found; that in which the officer is responsible to the secretary's department, and that in which he is responsible to the chairman. The Gas Council, it is noted, has two officers—the Publicity Manager and the Press Officer—both of whom are responsible to the Chairman. So far from being unnecessary, as some critics argue, the public relations service is essential, and the question is not shall it exist, but rather in what form shall it exist? The final conclusion is the most urgent. The centre of interest in an industry's relations with the public needs shifting away from the top. It is true that the spur of public scrutiny must be applied at all points, and that without ultimate control by Parliament domination by sectional interests might follow, but the individual consumer can hardly be expected to feel in close relation with a national board. That sense of remoteness which many of the public undoubtedly feel should be overcome.

The Acton Society Trust, associated with the Joseph Rowntree Social Service Trust, was set up 'for the purpose of promoting economic, political, and social research' and, as we have said, the report on 'Relations with the Public' is the last of the series of 12 on the nationalised industries. The papers have been widely accepted in Parliament and elsewhere by people of all shades of political belief and of none, as valuable and objective studies on topics of great public importance. Some time ago, at its own request, the Trust carried out a detailed investigation into the system of administration adopted by the Wales Gas Board, and it has lately announced a forthcoming report under the title of 'Nationalisation and the Operational Manager' showing how nationalisation has affected the status and responsibilities of the managers of the working units of which nationalised industries are composed. The announcement states that a comparison is made with the methods of large-scale private industry, and with the 'unusual system of management of the Wales Gas Board,' and that the report concludes with a discussion of the whole problem of decentralisation as revealed by these case studies.

THE SMALL THINGS THAT COUNT

BUT FOR THE FACT that it had been read to senior gas officers 18 months earlier Mr. T. N. Dent's paper to the South Western Section of the Institution of Gas Engineers last month might well have been taken as a sequel to that on 'Preventive Maintenance' which Mr. W. Morland Fox read to the London and Southern Section a few weeks ago. There was, however, no collaboration or collusion. The fact that both authors—one from the supply side, the other a contractor—emphasised the cumulative effects of small economies just went to show how both sides of the industry are recognising the urgent need for real economy. The emphasis in Mr. Dent's paper was not so much on the large and impressive savings which may be catered for by future base load working and integration schemes, nor the possible improvements in thermal and residual yields which are the subject of fuel surveys carried out by the South Western area scientific department under Dr. Arthur Marsden, but rather some of the many small items which form part of the daily routine of the large and small manufacturing stations. These by constant attention or neglect can make a not inconsiderable contribution, either to the satisfactory running of the station or to a costly system which brings discredit to the industry and no relief in gas tariffs for the consumer.

It is not often that an author is given a second chance with a paper 18 months after it is first prepared, but Mr. Dent found that the same story could be told again with little alteration. One feature of his paper was a comparison between sundry pre-war and September, 1951, prices. Some of the most striking increases were 710% on the cost of compo piping, 425% on purifier grids, 382% on receipt books, 370% on 1 in. gunmetal main cocks, and 330% on paint brushes. Prices have soared still further in the past 18 months and the need for the little economies enumerated in the paper has correspondingly increased. In many respects the paper was a counsel of perfection. As one of the contributors to the discussion remarked, it would seem that all the station engineer has to do is to take the paper and run the works on the lines there laid down. But it does not work that way. The labour problem, among many, limits the possibility of putting all the ideals into practice; nevertheless it is well to have an ideal and to aim as near to it as prevailing circumstances will permit.

Letter to the Editor

FUEL POLICY

DEAR SIR,—After reading your comments on fuel policy in the *Gas Journal* of March 25, p. 671, I am left wondering if the gas industry is any more sane in its approach to the use of coal than are other users, and if British fuel policy is not the modern Babel. Everyone speaks his own language oblivious of his faults.

Gas men have staked a claim on coking coals. Why? Because they carbonise them. Why carbonise? Because by selling part of the residue of carbonisation (coke) they can produce the cheapest gas. Fair enough, but what *does* the gas industry do with its coke? It unhesitatingly consumes one-fifth or one-quarter of this precious coke in producers for heating its retorts when a non-caking coal could perform this function! Is this a relic of the days when hot coke was fed direct from retort to furnace? It may consume a further eighth part in boilers where a steam coal could be used instead. It may use another sixth of its coke production in the manufacture of water gas which may or may not be a justifiable use of coke with its prerequisite of coking power.

It refrains from benzole production because that would increase the tonnage of coke for sale, although this could in many cases cheapen the gas, and would inevitably do so if the Ministry of Fuel arranged the disposal of coke when available to replace coal.

The Simon Report called for an expansion of the carbonising industries so that coke and smokeless fuels would be available in ever-increasing quantities for the domestic grate. The gas industry swelled with pride and did nothing, and why should it when coke exports were so lucrative? The Deil was weel, but there have been times and will be again when he will not be so well. In fact are there not a few tons of coke gathering in his backyard now?

So it appears the gas industry is afraid to commit itself to produce more coke when it could with little trouble do so and custom has bound it to certain misuses of the coking power of its dearly bought coal.

The penal rise in the prices of gas and coking coals suggest a change in policy inasmuch as the use of top price coking coal to produce coke for heating retorts can no longer be justified.

I think Mr. Boon has something when he suggests we be a two fuel industry, if only for 10 years. What if it does mean building up a coke selling organisation? Better than being merely 'two-faced.'

Yours faithfully,

THERMITE.

Diary

April 11.—Scottish (Eastern) Juniors: Paper by I. M. Anderson. Kirkcaldy.

April 14.—Wales Juniors: 'The American Gas Industry,' E. M. Edwards. Hereford.

April 15.—Eastern Section, I.G.E.: Visit to Peterborough Gasworks.

April 15.—Yorkshire Juniors: Visit to Works of De La Rue, Ltd. Warwick.

April 15.—Manchester Juniors: Evening Meeting at Radiant House, Liverpool. Reading of Papers.

April 16 and 17.—Scottish Association of Gas Managers: Spring Meeting at Peebles.

April 16-17.—Wales and Monmouthshire Section, I.G.E.: Spring Meeting, Hydro Hotel, Llandudno.

April 17.—Scottish (Western) Juniors: Annual General Meeting: Technical College, Glasgow.

April 18.—Manchester Juniors: Visit to Birchenwood Coke Ovens, Kidsgrove. 'Liquid Purification,' R. Pollard.

April 18.—London and Eastern Juniors: Joint meeting and visit to the Bromley-by-Bow Gas Station of the North Thames Gas Board, 2.15 p.m.

April 21.—London and Southern Section, I.G.E.: 'The Law and the Gas Industry,' R. G. Huxtable, M.B.E., 17, Grosvenor Crescent, S.W.1.

April 24.—Midland Section, I.G.E.: Annual General Meeting, Birmingham.

April 24.—Manchester and District Section, I.G.E.: Annual General Meeting, Manchester.

April 25.—Western Juniors: Weston-super-Mare. Visit to Works. Annual General Meeting and Presidential Address.

April 27-28.—Industrial Gas Conference, Birmingham.

April 28.—Midland Juniors: Annual General Meeting: Staff Mess Room, West Midland Gas Board, Council House, Birmingham.

April 27-May 8.—British Industries Fair, Castle Bromwich. Gas Council Stand No. D.641/540.

April 30.—North Thames G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2.

April 30-May 2.—East Midlands Gas Board: Fourth Annual Staff Conference, Skegness.

May 1.—London Juniors: 'Southampton's Gas Distribution System,' R. K. Harrison. 178/180, Edgware Road, W.2, 6.30 p.m.

May 5.—East Midlands G.C.C.: Victoria Station Hotel, Nottingham, 11.30 a.m.

May 11-16.—Glass Industries Exhibition, New Horticultural Hall, Westminster. Gas Council exhibit.

Personal

Mr. G. J. W. Turner, Managing Director of Wrights Ropes, has been appointed a Director of Wellington Tube Works.

◇ ◇ ◇

Mr. A. Whitaker, O.B.E., has been appointed Director of Extramural Research to the National Coal Board. Besides its own research establishments at Stoke Orchard and Isleworth, the Board has extensive interests in several research associations and sponsors projects at a number of universities and with commercial firms. This work will in future be directed by Mr. Whitaker, who will be responsible to the Director General of Research at headquarters, Dr. W. Idris Jones.

Mr. Bertram White, Technical Director of the Federation of British Industries, has resigned to take up an industrial appointment. **Dr. J. E. G. Harris** will succeed him temporarily as Acting Technical Director. Dr. Harris had a long association with Imperial Chemical Industries, Ltd., from whose service he has now retired.

◇ ◇ ◇

Mr. Norman Readman has been appointed Managing Director of the Consolidated Pneumatic Tool Co., Ltd., in succession to **Mr. J. A. Owen,** who has intimated his wish to resign from that position after completing 50 years of uninterrupted service with the company. Mr. Owen will continue as a Director and technical consultant

---

GOLF CHALLENGE MATCH

THE Ministry of Fuel and Power and the Gas Council met in a Golf Challenge Match at Sunningdale on March 30. In a sporting contest the Ministry team, which included Mr. E. Pollitt, who has won both the Surrey Amateur and Civil Service Championships, proved the stronger and won by 6½ matches to 2½.

In the top matches between the respective Captains, Sir John Maud received five strokes from Colonel Sir Harold Smith and got home by 4 and 2 after a hard struggle. Mr. H. C. W. Roberts (Chief Inspector of Mines) was another Ministry winner when he beat Mr. C. H. Chester. Gas Council winners were Mr. O. R. Guard, who had a comfortable win over Mr. A. E. Fazey by 7 and 5, and Mr. G. E. Currier, who defeated Mr. Keith Stock by 4 and 3. Mr. T. Mervyn Jones halved his match with Mr. Martin Jones.

The weather during the morning play over the testing Sunningdale Old Course was far from kind and the first pair out faced driving rain and gale. Conditions improved later, however, and the friendly greensomes in the afternoon were played in sunshine. Both captains expressed their appreciation of the facilities provided by Mr. Bernard Drew, Secretary of the Sunningdale Golf Club, and the match proved such an enjoyable occasion that it is hoped that a similar contest will be organised later in the year.

RESULTS (Ministry first): Sir John Maud—Captain (24) beat Colonel Sir Harold Smith—Captain (18) by 4 and 2; Mr. E. Pollitt (Scr.) beat Mr. D. D. Burns (8) by 4 and 2; Mr. H. C. W. Roberts (12) beat Mr. C. H. Chester (15) by 6 and 5; Mr. K. L. Stock (24) lost to Mr. G. E. Currier (21) by 4 and 3; Mr. W. C. C. Rose (14) beat Dr. R. S. Edwards (19) by 2 and 1; Mr. A. E. Fazey (14) lost to Mr. O. R. Guard (12) by 7 and 5; Mr. C. S. Jenkins (20) beat Mr. R. S. Hinder (22) by 4 and 3; Mr. Martin Jones (22) halved with Mr. T. Mervyn Jones (19), and Mr. J. S. Smith (12) beat Mr. S. Smith (20) by 7 and 5.

Photographed on the occasion: Top left—Colonel Sir Harold Smith (left) and Sir John Maud (right) chat with the Secretary of the Sunningdale Club, Mr. Bernard Drew. Bottom left—Mr. R. S. Hinder drives from the first tee watched by Mr. C. S. Jenkins and Mr. T. Mervyn Jones. Our photograph on the right is of Mr. D. D. Burns, Mr. W. C. C. Rose, and Dr. R. S. Edwards.

Midland Juniors' President's Day

IN no technical association in the industry is President's Day treated with greater enthusiasm and importance than in the Midland Junior Gas Association. The latest President to be honoured in this way was Mr. D. J. Ward, whose term of office is now drawing to a close, and the Midland Juniors rallied in traditional style at Birmingham on March 26 to give him their support.

Members assembled at the Windsor Street works in the morning to undertake an inspection of the works, the route including most of the production side. Although the area of the works is only 24 acres, this is the largest production unit in the West Midlands Gas Board's area, with a nominal production figure of 26 mill. cu. ft. per day of coal gas and 9 mill. cu. ft. per day of water gas; figures considerably in excess of this have been obtained on occasion.

Coal is received from the railway by one of four works locos, and passes over one of two 50-ton weighbridges on the way, by overhead viaducts, to the coal handling plant, where the wagons are unloaded by rotary tippler or end tippers.

Gas Making Plant

Carbonising plant consists of four ranges of Woodall-Duckham retorts: 66 upward heated 62-in. retorts with battery producers and waste heat boilers, 44 downward heated 57-in. retorts with battery producers and waste heat boilers; and 56 upward heated 103-in. retorts with producers and waste heat boilers.

A Power-Gas mechanical producer is installed in the retort house for dilution purposes, and this gas is fed into the coal gas stream at the outlet of the retort house. Foul gas leaves each ¼ range through Askania regulators, mixes, and passes through five Cyclone tar extractors and five primary condensers before passing through two Lodge Cottrell detarrers. Three turbo exhausters pass the gas to three Holmes static washers and then to the oxide purifiers.

The carburetted water-gas plant consists of three Humphreys & Glasgow automatically operated machines with automatic charges, self-clinkering grates and waste heat boilers; each machine is fitted with 'High Peak' process which enables the same volume of gas to be made on two machines as is normally made on three machines, in the event of a breakdown on one machine.

The President' Day luncheon was held at the Grand Hotel.

Mr. J. A. Tomes, Vice-President, proposed the toast of 'The West Midlands Gas Board.' Mr. Tomes referred to the unfortunate absence, due to important commitments elsewhere, of the Chairman and Deputy Chairman of the West Midlands Gas Board. Their inability to be present was regretted by all, he said, but the Association was indeed fortunate in having as a representative of the Board Alderman C. G. Spragg. A part time member of the Board, Alderman Spragg held the O.B.E., was an ex-Mayor of Smethwick, was an Alderman of the Smethwick City Council, and was Secretary of the Midland Federation of Building Trade Operatives. In many ways he had much in common with Mr. George Matthews, and had commended himself to everyone in the industry. On such an occasion, continued Mr. Tomes, he must also mention the Secretary of the Board, Mr. F. H. Cureton, to whom they were indebted for his wonderful help and encouragement. They had that morning been privileged to inspect the largest works in the Board's area, and had been impressed by the progressive planning and efficient organisation. For such facilities placed at their disposal, for the keen interest taken in the Association's activities, and for the generous hospitality given that day, members offered their sincere appreciation and thanks.

The Next 20 Years

Responding, **Alderman Spragg**, O.B.E., J.P., mentioned the many changes which which had taken place in the gas industry since he had first seen a gasworks. He trembled to think what violent changes might take place in the next 20 years, judging by present trends and portents. Important experiments would be performed in this region of the gas industry, for it must be admitted that the West Midlands area had an important part to play in development and research at the behest of the Gas Council. As he saw it, the future of the gas industry lay in their hands. Their Association was working up to the places which would fall vacant at the top in the next few years. Theirs was more than a social association; it combined social activities with its main purpose—education—and he wished them all every success.

The toast of 'The Midland Junior Gas Association' was proposed by **Mr. G. E. Currier**, O.B.E., President of the Institution of Gas Engineers. It was, he said, a privilege to be invited to propose this toast, and he would like them all to know that he had come because he had wanted to come, and for three reasons. He had been fortunate in joining their Association soon after he had entered the gas industry, and he remembered with gratitude the value he had obtained. Some of the friendships formed in those early days he still retained. It was always a privilege to represent the Institution of Gas Engineers, and doing so had provided him with some interesting experiences this year both in this country and abroad. It was gratifying to note the esteem in which the Institution was held among kindred bodies. They were still doing their best to enhance its prestige, and in this they had been greatly encouraged when Her Majesty the Queen had consented to give her patronage to the Institution, and the Duke of Edinburgh had become a Life Member. He had mentioned two reasons for his pleasure at attending their President's Day. The third reason was that their President was an old friend with whom he had once shared some delightful musical evenings after work in the Birmingham Gas Department. He wished him every success and hoped that his year of office would provide him with many happy memories.

Mr. Currier, in the course of his remarks, also referred to value of including in the membership of their Association the staffs of contracting firms, and pointed out that the Institution would admit anyone with the necessary qualifications. The Institution would certainly have been the poorer without the services of Sir Frederick West and Dr. Harold Hartley.

Responding, the **President** said that they regarded their Association as a live one, and he felt that this was reflected in their growing membership, which now totalled 480. Attendance at meetings and visits were also good, and it was significant that of the members present, representing as they did four area boards, those who lived farthest away came most often. The objects of the Association, in this their 48th year, were the same as they had always been—the education of members, particularly young members.

Tribute to the Board

The President then recalled the meetings and visits which had composed the programme of the present session, and referred to the assistance rendered by the West Midlands Gas Board in allowing members time off to attend meetings. Other junior associations were not so fortunate, he said, and they must therefore be thankful. If that spirit of encouragement was continued they could look forward not only to their 50th year but to many more years to come. To his knowledge there were present 15 Past Presidents of the Association, and he felt this was a striking testimony to the way in which interest in the Association's affairs was retained.

To the toast of 'The Guests,' proposed by the Junior Vice President and Secretary of the Association, Mr. H. J. Reynolds, Mr. J. J. Priestley, of W. C. Holmes & Co., Ltd.

After lunch members were conveyed by coach to the B.S.A. Works in Armoury Road, where they were welcomed by Mr. T. P. Whittington, the General Works Manager, and Mr. A. Toye, Personnel Manager. After a group photograph had been taken, the visitors were conducted on a tour of the works and were able to see certain of the processes employed in the manufacture of motor cycles. B.S.A. and its associated companies are the largest manufacturers of motor cycles in this country, possibly in the world, producing machines ranging from 125-650 c.c. at the rate of some 80,000 a year.

Later the Association was entertained at tea in the staff canteen, when a vote of thanks was proposed by the **President.** The arrangements, he said, had been excellent, and the organisation and hospitality experienced had fittingly brought a memorable day to an end.

Responding, **Mr. Toye** said how much B.S.A. had enjoyed having the Association as its guests, and hope that it would go on from strength to strength.

Juniors Visit Yorkshire Copper Works

THERE was a large attendance of members of the Yorkshire Junior Gas Association on the occasion of the 'President's Day' visit to the Yorkshire Copper Works, Ltd., on March 18. The visitors, headed by their President, Mr. C. G. Broome, were the guests of the Directors at a luncheon before making a tour of the extensive works which covers some 20 acres on the west bank of the Aire and Calder Canal, and the River Aire. The products of the firm, which has been in existence since 1909, and which employs well over 3,000 people, are familiar names in the gas industry 'Yorkshire' tubes and 'Yorkshire' fittings have for many years been used by most gas undertakings up and down the country for service, carcassing, and installation work. The firm has developed into the largest works in the world devoted solely to the manufacture of non-ferrous tubes in copper, brass, cupro-nickel and many other special alloys, and are the sole makers of the famous. 'Yorcalbro" (aluminium-brass tubes and 'Yorkshire' capillary fittings.

Members of the Yorkshire Junior Gas Association visit the Yorkshire Copper Works, Ltd., on President's Day.

In the absence of Mr. E. Duffield, Managing Director, owing to illness, a welcome was extended to the visitors at lunch by Mr. H. F. Sherborne, M.C., General Manager and Director. In the course of his remarks he outlined the firm's activities and mentioned some of the various processes they would be seeing during their tour of the works. Speaking of the service his firm gave to the gas industry in the distribution of gas, Mr. Sherborne paid tribute to the pioneer work carried out by the late Mr. John Barker, gas engineer and manager, Nairn, in connection with the development of copper tubes and fittings for the gas industry, and for the paper he gave to the North British Association of Gas Managers at Kirkintilloch in 1937.

Before the tour of the works the President of the Yorkshire Juniors, Mr. C. G. Broome, gave his Presidential Address. A vote of thanks to the President on behalf of the Association was moved by Mr. J. Brandon (Sheffield) Mr. Broome briefly responded and later invited Dr. R. S. Edwards, Chairman of the North Eastern Gas Board, to address the members.

Dr. Edwards said it was something of significance that in two successive years the Yorkshire Juniors had had specialists as Presidents. The larger scale of the nationalised industry made greater opportunities for specialists, but at the same time he felt there would always be room in the industry for the district engineer. He was glad the President had mentioned the educational service which was now available in the industry. This service was a very expensive item, but by giving these facilities the boards hoped to give the juniors the opportunity of specialising. Dr. Edwards said he was looking forward very much to seeing the works. The Board was proud that it had such a progressive and gas-minded consumer in its area; it was in fact, the largest consumer in the Board's area of supply.

The President thanked Dr. Edwards for his remarks and for attending the meeting.

The tour of the works was an interesting and enlightening experience. The visitors saw every stage of the manufacturing process of non-ferrous tubes, from the casting of the metal into cylindrical billets, to the conversion into a hollow shell, and finally the cold drawing into the finished tube.

After the tour the visitors returned to the exhibition hall for tea. Mr. D. Henderson, Junior Vice-President, in moving a vote of thanks to the Yorkshire Copper Works referred to the care and attention given at every stage of manufacture of 'Yorkshire' products, and instanced the sample extracted from each melt which was subject to chemical analysis and laboratory tests before the billet was released for processing. He enquired when the gas industry would really accept copper tube for underground services. Water boards had used copper services between main and premises since the twenties, and they were concerned with internal pressures of upwards of 100 lb. per sq. in., while the gas industry was concerned with inches water column. The advantages of copper with its long length, smooth interior walls, absence of scaling, and elimination of choked services must surely have an appeal. Particularly so, when those who could remember contrasted the heavy weight steam quality wrought iron tube of the pre-war years with the light weight tube of the post-war era. Could Yorkshire Copper Works Ltd., or the Copper Development Association give an authoritative statement on the effects of differing soils on copper, and copper alloy tubes, in order that the gas industry could really determine the advantages of copper for underground services?

On behalf of the Yorkshire Junior Gas Association he asked Mr. E. Neville Duffield to convey to his father, and Mr. Sherborne and his co-directors, the staff and the workpeople, the warm thanks of all present for the hospitality and excellent arrangements made for their visit.

Sales Virility

THE FIRST ANNUAL REPORT of the North Western Gas Board's Salesmen's Circle is indicative of the Circle's virility and go-ahead spirit. Before its reorganisation 17 months ago, the Circle's membership was in the region of 200. Today the membership figure is rather more than 2,400, representing many sections of the Board's employees.

President of the Circle is Mr. H. Butters, Member of the Board; the Chairman is Mr. J. W. Rodgers and the Vice-Chairman Mr. S. H. Packer.

The Scottish Fuel Efficiency Committee has proposed to the Government that smokeless zones be established in ten Scottish towns and cities. These include Glasgow, Edinburgh, Aberdeen, Dundee, Greenock, Paisley, Kirkcaldy, Motherwell, East Kilbride and Glenrothes. Edinburgh and Greenock have already been given powers to create such zones but have not yet put these powers into use. It is suggested that these ten centres should announce the intention to establish smokeless zones by a given date to allow users an opportunity to convert to smokeless fuel, gas or electricity.

Gas in France

—By ASHTON

A selection from the French Technical Press

CONSIDERABLE interest is being taken in France in combined services of electricity and heat from the power house. In the all-steam station it takes the form of the release of steam from the turbines at a temperature and pressure at which it is still useful as a source of heat for industrial and domestic purposes. The use of the back pressure (pass-out) turbine is a solution which is simple and relatively cheap even though the output of electricity per unit of plant is considerably reduced. Its obvious disadvantage is its lack of flexibility. In its simplest form it can only function efficiently when the demands for power and for heat follow each other pretty closely, a quite exceptional circumstance. Attempts have been made to cope with the difficulties arising out of non-correspondence between the two loads by the use of the steam accumulator, by the introduction of a condensing turbine to be put into circuit as required and by co-ordination with the larger public supply.

Advent of the Gas Turbine

'The advent of the gas turbine has brought a new element into this field.' M. Chambadal discussed the possibilities of the new situation thus created in a paper presented to Ste. des Ingénieurs Civils in May last, a paper which is now available in the Memoirs of the Society, April to June, 1952, under the title 'The Application of the Gas Turbine to the simultaneous production of Electricity and Heat.' It would seem more exact, he says, to speak not of a new element but of a veritable revolution, for the gas turbine provides not only a new solution of this problem but a number of solutions which differ among themselves both in their conception and in their method of application.

M. Chambadal begins his discussion with a brief description of the simplest form of gas turbine layout; compressor, combustion chamber, gas turbine and generator. The efficiency of this arrangement is only of the order of 18% but this can be increased by the addition of refinements and complications to 30%. The author's descriptions and diagrams are most lucid. In the open circuit air is drawn into one compressor, cooled in the water cooler, passes to a second compressor, through a heat interchanger with exhaust gases from the turbine, to a first combustion chamber, thence to the first gas turbine exhausting through a second combustion chamber and finally through the heat interchanger to atmosphere. The products of combustion are mixed with the air passing through the system. The number of installations on this system in operation or under construction exceeds a hundred.

In the closed circuit arrangement, the combustion chambers are external to the stream of working fluid. The final exhaust returns to the system by way of a water cooler to the first stage of compression. A 12,500 KW set on this system has been installed at the Saint-Denis power station by Escher Wyss.

The Pescara Generator

In all these cases compression of the working fluid (air) is achieved at the expense of the work generated by the expansion of the gas in the turbine. But this compression can be done by an external source of energy as, for example, an internal combustion engine. This engine and the compression play the same part as the boiler in a steam set. The author describes the Pescara generator which consists essentially of two opposed 'free pistons' working in a cylinder without rotating parts. Each piston is of two diameters, the larger acted upon by the explosive combustion of oil fuel and the smaller compressing air which, mixed with products of the combustion, the main source of heat, passes to the turbine. Two installations are in being, at Rheims and at Venissieux (Rhône), each of 1,400 KW capacity. The first had been running for 1,000 hours showing an efficiency of 42% in the generator, considered alone.

The theory of these systems is discussed but the author goes on to describe several other applications of these combinations. One of the most interesting of these is a proposal by the Escher Wyss Company to combine a generator of 10,000 KW with the production of hot water for urban supply. It is a closed air system with the hot water derived from an elaboration of the intercoolers between the two stages of compression. Water is obtained in a number of streams at temperatures ranging from 110°C. to 54°C. This set would have a maximum output of 10,000 KW reduced to 8,900 when the maximum quantity of hot water is also obtained amounting to 14.2 $\times$ 10^6 Kcal/hour.

Residual Temperature

The gas turbine may also be followed by a waste heat boiler in similar fashion to those fitted to internal combustion engines but the exhaust from a gas turbine (really a hot air engine) contains sufficient oxygen to assist in the combustion of the liquid or solid fuel of the standard boiler. Thus whereas the temperature of the steam raised in a waste heat boiler is limited by that of the waste gases passing through it, there is no such limit when the exhaust gases are used to augment the temperature in the combustion chamber of a normal boiler. In an installation at their works at Zurich designed by the Ste. des Ateliers de Construction Oerlikon the exhaust from an experimental 1,000 KW gas turbine is fed to two boilers after first heating the compressed air of the turbine. The residual temperature is still sufficiently high to effect a substantial saving in the fuel consumption of the boilers. Other examples are given.

In all these examples the steam raiser is placed after (or down-stream from) the gas turbine. But it is equally possible to place the boiler before the gas turbine, to use a common combustion chamber for the service of the gas turbine and that of heat supply to steam or hot water. And this scheme can be completed by the addition in line of a steam turbine. A more elaborate proposal still is that described by M. Mercier in 1946 in which four Diesel motors with opposed pistons (as above described) are used as compressors, and source of heat, actuating a gas turbine and a steam turbine. Two installations on this principle have given encouraging results. The example of the waste heat turbine under construction at Coventry is also cited.

Further Developments

Further developments include the water-cooled turbine rotor which will enable gases of higher temperatures (above 1,000°C.) to be used. A combination (patented by Brown-Boveri) is mentioned with diagram showing the use of a producer operating under pressure as the source of heat. The theoretical possibilities of the several systems are discussed. It is evident that these possibilities are at the optimum when the gas turbine is employed in the simul-

taneous production of power and heat and when these are connected with a very large system of energy production. The problem is capable of several solutions. The best solution will be that which corresponds at the minimum cost of operation of the system as a whole whatever may be the specific efficiency of the installation under consideration. This paper is a classic, well worth study in full.

Increase in Gas Consumption

The *Journal des Usines à Gaz*, February issue, comments upon the statistics of Gaz de France published in December. They show an increase in sales of 5% upon the previous year and of 50% upon 1938. The increase is attributed to the effect of the severity of the winter on the demand for space heating. Consumption in November was 14.35% above that in the same month of 1951. The tonnage of coke available for sale reached a record with 9.2% increase over 1951. It is noted that these increases have been achieved with a substantial reduction in effective personnel employed.

Gasification of Petroleum Oils

To the January issue M. P. Agron, Engineer of the Ecole Polytechnique, contributes a brief study of the cracking and conversion of the lighter oils by 'minimum oxidation.' He prefaces his remarks by a protest against the too free use of English and American technical terms in French literature—resulting sometimes in an extraordinary technical jargon, generally quite unnecessary. He admits that 'cracking' may be adopted with advantage but suggests that 'reforming' might very well be represented by 'conversion'—a remark of which English writers might take note.

His conclusions are that to preserve in the gaseous mixture the maximum of hydrogen and carbon monoxide and the minimum of carbon dioxide, if air alone is used it should be in the minimum quantity to maintain 'thermal autonomy,' but that this is not so important when steam also is used. The same reasoning does not apply to the gasification of the heavy oils where methods of analysis are not yet sufficient to a complete solution of the problem.

Detection of Corrosion by Radiation Methods

A contribution by M. F. Gisen, Engineer to Ruhrgas A.G., in the January and February issues is a comprehensive essay on the application of radiation methods ('X-ray') to the detection of damage by corrosion in large gas mains. Towards the middle of 1947 at different points in the mains system of the Ruhr localised damage was observed in the lower portions of the mains and differing widely from corrosion defects which had previously been observed. The outside of the main appeared to be in good condition except for small punctures. It was evidently a question of internal corrosion of unprecedented extent, and this was confirmed on close examination. Investigation showed that these defects arose in the immediate neighbourhood of siphons which had not been emptied for a long time and where emptying was rendered impossible by corrosion of the dip pipe.

For a complete examination it was necessary to put the mains out of circuit and take them up. But as this meant a serious interference with operation endeavours were made to develop a non-destructive method of determining the thickness of the wall of the main. The use of X-rays was decided upon. It depends in the first place on the property of short-wave electromagnetic radiations to penetrate materials with a reduction in intensity, as ascertained by a Geiger counter. The theory and practice of this method is set out. The apparatus is mounted on a ring carriage with wheels which is moved along the main while observations are taken. The article is illustrated by diagrams and photographs which confirmed that in this way corrosion effects can be accurately located. Another possibility in the application of this method consists in the location of deposits and pockets of water in the mains.

Coke Oven Effluents

The January issue carries a summary of a paper by M. Coin of the Paris Water Supply. The paper is abstracted by M. S. Taubert, who writes: 'This paper, which contains points of view often little known, constitutes an excellent résumé of the question of effluents from coke oven plant, gasworks and other industries treating phenols.' The paper is dominated by the treatment and effect of phenols in the effluent. These compounds are removed by chemical means, mostly oxidation, by absorption in activated carbon, by extraction using steam (the Koppers method), by extraction in solvents and finally by biological oxidation. Even this last is seen from the point of view of phenol. The work at Stivichall, Coventry, is cited together with an experiment of Gaz de France at Taverny, where bacterial beds are installed at the point of production.

Coal Production in 1951

In 1951 coal production in France reached 54,975,000 tonnes, approaching very nearly to the 1930 record of 55.1 mill. These substantially equal outputs were obtained by 169,720 miners working 285 days in 1951 against 208,770 miners working 300 days in 1930. Including production in mines not nationalized, in the Sarre and coal imported, total sales in France in 1951 amounted to 64,956,000 tonnes, of which 5,057,000 went to Gaz de France, 5,559,000 to Electricite de France, 15,932,000 to industry and 13,957,000 to domestic fires and small industry.

ATMOSPHERIC CORROSION OF STEEL

IN a recent paper to the Corrosion Group of the Society of Chemical Industry (Nottingham Section), Dr. J. C. Hudson and Mr. J. F. Stammers presented and discussed the results of routine observations on the corrosion of the small reference specimens of ingot, iron or zinc exposed at the atmospheric testing stations of the Corrosion Committee all over the world. The data, which related to more than 20 sites and up to 20 separate annual tests at each, provides a good indication of the effect of climatic differences on atmospheric corrosion. In Great Britain, where for most of the year the climate is sufficiently humid to promote corrosion, the authors recall that the determining factor for its severity is the sulphur pollution of the air. Tests made in collaboration with the Fuel Research Station at 16 sites where the atmospheric pollution is measured have shown an almost perfect correlation between the amount of sulphur dioxide taken up from the atmosphere by lead peroxide pollution gauges and the rate of corrosion both for steel and zinc. In the absence of sulphur pollution, corrosion at the sites oversea is generally slight; and in dry climates it is negligible. Preliminary tests on specimens exposed at different heights on the Sutton Coldfield television mast suggest that the effect of distance from the ground is secondary to the natural variations in corrosion rate from one year to another.

Discussing some details of experimental technique, the authors state that work, in which American investigators have collaborated, has confirmed that at low copper contents variations of a few hundredths of 1% in copper content have a marked effect on the corrosion resistance of ingot iron. Because of the increasing difficulty in controlling the copper content of different batches of ingot iron, the small reference specimens used in the Corrosion Committee's most recent tests have been made of copper-steel instead of ingot iron. The copper-steel now in use contains about 0.3% Cu, and minor deviations from this figure should not affect the corrosion rate within the experimental error. It has also been found that, although it is advisable to stir the inhibited hydrochloric acid solution (Clarke's solution) used for derusting exposed iron or steel specimens after test, failure to do so does not impair the accuracy of the results, at least for ingot iron or copper-steel.

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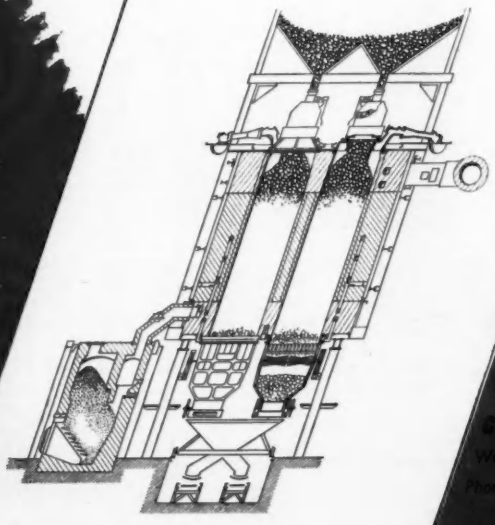

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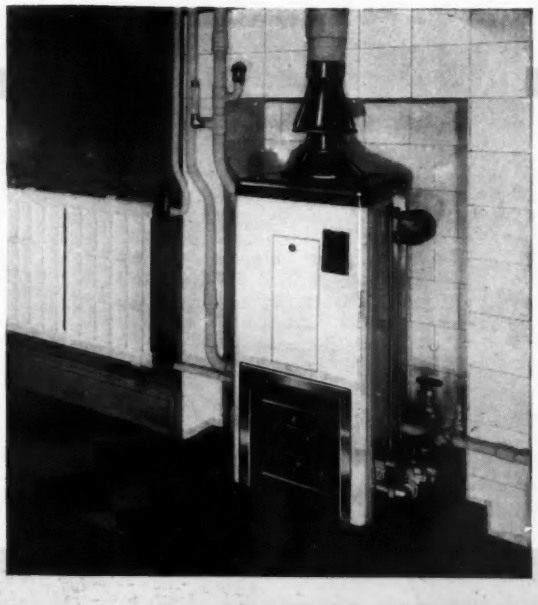

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A FLEXIBLE HOME SERVICE DISPLAY

This home service display has been prepared by the South Eastern Gas Board for demonstrations at meetings of Townswomen's Guilds, women's institutes, etc. The background breaks down into small units, each of which is provided with a canvas case to protect the display during transit. A shelf will be built round the front of the demonstration table to carry the prepared dishes. The colour scheme on the side illustrated is white, mustard, and eau-de-nil. On the reverse side either a white or cream surface is available so that the display can be adapted to afford a fitting background for cookers, fires, or other appliances of any shade. The panels are interchangeable and the design is so flexible that it will suit halls of any shape.

S.B.G.I. Awards

THE COUNCIL of the Society of British Gas Industries has again this year awarded Silver Medals to the Junior Gas Associations for the best papers adjudged to have been presented during the year by their members at a general meeting.

Twenty-six papers were submitted by eight Junior Gas Associations for adjudication, and the following awards have been made:—

Midland.—K. Davis for paper 'The Use of Town Gas in the Manufacture of Domestic Pottery in China and Earthenware Clays.'

Manchester District.—H. Grimshaw for paper 'Periodical Cleaning and Inspection Scheme for Gas-fired Central Heating and Steam Raising Boilers.'

Scottish (Eastern District).—R. H. Foston for paper 'Some Aspects of Gas Distribution.'

Yorkshire.—W. J. Steed for paper 'Planning for Better Sales and Service.'

London and Southern.—F. W. Lockwood and D. J. Davies for paper 'Town Gas High Temperature Radiant Heating in Industry.'

Western.—R. Pratt for paper 'Mains Extension in Relation to Housing Development.'

Northern.—E. L. Robson for paper 'An Introduction to Prestressed Concrete.'

Wales and Monmouthshire.—R. H. Hanford for paper 'High Pressure Distribution.'

Llandudno Meeting

A FULL PROGRAMME has been arranged for the third spring meeting of the Wales and Monmouthshire Section of the Institution of Gas Engineers at Llandudno on April 16 and 17, under the Chairmanship of Mr. H. Maycock, Engineer, Manager, and Secretary of the Holywell, Flint, and Ruthin undertakings of the Wales Gas Board.

The first day will be given up to golf competitions at the Maes Du Municipal Course, Llandudno, bowls competition at the municipal greens, a motor coach visit to Bodnant Gardens, and a dance at the Hydro Hotel, at which the golf and bowls trophies will be presented.

The meeting at the Town Hall starts at 10 a.m. on the Friday, and the routine business will be followed by Mr. Maycock's Chairman's Address and a paper by Mr. R. W. Crowther, of W. J. Jenkins & Co., Ltd., on 'Intermittent Vertical Retorts.' The official luncheon will be at the Hydro Hotel and the meeting will be resumed at the Town Hall at 2.45 p.m. to discuss two papers already presented, the first by Mr. L. J. Clark (North Thames Gas Board) on 'Steam and Power in the Gas Industry,' first presented at the International Gas Conference in Brussels in 1952, the other by Mr. M. S. Gaskill (West's Gas Improvement Co., Ltd.) on 'Fuel Economy in the Gas Industry,' presented at last year's meeting at Tenby. In the evening there will be a showing of the latest gas industry films in the ballroom of the Hydro Hotel.

CLAYTON CUP WINNERS

THE annual dinner of the sports association connected with Clayton, Son & Co., Ltd., gas and constructional engineers, of Hunslet, Leeds, was held recently. The photograph shows trophy winners for 1952.

Left to right: G. Moffat (fielding), W. Allen (swimming), G. Broom (batting), W. Newton (league trophy for highest individual score—153 not out), J. Snape (golf), A. Warrington (bowling), and A. Richardson (horticultural).

The firm's principal manufacture is reflected in the Gasholder Trophy, which is presented to the winners of the cricket inter-department competition—this year, Pepper Road Works. Mr. E. Rickerby, J.P., President of the Leeds and District Football Association, proposed the toast of the Association, which was responded to by the Chairman of the Company, Mr. S. Cawthorne. Mr. S. C. Thomson proposed the toast of the guests, the response being by Mr. N. Shuttleworth, President of the Leeds and District Cricket League. In addition to the sections mentioned, the Association covers angling, bowls, children's entertainment, football, etc.

Our Backs Are to the Wall

Some Aspects of Works Management

By T. N. DENT, A.M.I.Mech.E.,

Sub-Divisional Manager, Weston-super-Mare, South Western Gas Board

From a paper presented to the South Western Section of the Institution of Gas Engineers, Cheltenham, March 18, 1953

This paper was prepared in 1951 when, although acutely aware of the rising trend in costs, gas engineers looked to the future with some measure of optimism as to the possibility of financial stabilisation, and even more particularly to increased sales of gas and appliances. Now, 18 months after the South Western Gas Board's senior officers' conference at Moretonhampstead at which the paper was first presented, the industry is still enmeshed in the inflation of the cost of materials, goods, transport, and labour. No apology therefore is offered for the fact that the emphasis in the paper is on costs and savings. 'Our backs are to the wall', says the author, 'and no saving however small must be overlooked if we are to resist with any success an increase in the price of gas and at the same time maintain the standard of our service to the consumer.'

CLEANLINESS and tidiness is not a fetish, but a necessary contribution to the efficient and economical operation of works, large and small. To the visitor, whether technician or layman, a clean and tidy works reflects the method of approach of the engineer in charge to get the most from his plant and the best out of his men. It is better in the long run to clean up day by day with a constant establishment at minimum level than to have to face a major operation at long intervals, possibly to prepare for a works inspection and involving a large number of men taken off their normal jobs which must suffer in consequence; in any case this latter approach makes no contribution to the prevention of waste because the opportunity will have passed of drawing attention to the consequences or identifying the offenders.

I have in mind not only the unskilled, but also the skilled and semi-skilled men who do not clear away the surplus materials from the site when they have finished a particular job, but leave behind the few nuts and bolts, the red lead, paint brushes, electrodes, pieces of cable, solder, timber, off cuts from steel plates and bars, cement, sand, bricks and so on. A review of prices of such items, their increase over the preceding years, and in some cases their scarcity today, shows that we cannot afford to ignore the odd items here and there; even though individually they appear insignificant they have to be paid for first by the Board and then the gas consumer.

Our own employees are not alone in this respect because it applies almost equally to contractors, and the works staff must not take the view that it is entirely the contractor's business to look after his own materials; the Board still has to pay in the end. In any case, our own employees can receive injuries by falling over, say, a cast iron collar or a ladder left in the walking way, irrespective of whether they are contractors' materials or our own.

Many accidents are caused in industry by men slipping on or falling over small obstacles or climbing over large ones which should be either not there at all or should be roped off until removed; human nature being what it is, even the laziest of our species will often get entangled in climbing over or through obstructions instead of walking around them.

Transport, too, may suffer damage if the driver is not wholly observant while in the works yards. As an example of what may happen I quote the case of a van driver who failed to see a strip of iron lying in the yard and as he drove over it the iron jumped up and was caught between the axle and the ground.

Unfortunately, a lot of small surplus items seem to find their way into coal and coke heaps, and for some reason or other oxide heaps appear to qualify consistently as a natural dumping ground for all kinds of waste and rubbish, which sooner or later becomes a potential source of damage to plant and injury to employees. Continuous and insistent attention by the management to cleanliness and tidiness is an incentive to the employee to make his own voluntary contribution and a constant reminder that his employer will not accept anything but the best from both men and plant. When he is called upon to give that extra effort on a breakdown or emergency work, how much better it is that a man can get down to the job with a sense of urgency that is otherwise lacking if time has to be spent cleaning up before the defect can be exposed. It is not only on the plant and in the yards that cleanliness and tidiness should be achieved, but also in the workmens' mess rooms and washing and changing rooms.

Under a policy of full, continuous and unrestricted employment, a shortage of suitable labour is not helped at all if the men's quarters are less wholesome than in other heavy industries, and the formation of the consultative committees should be of benefit in driving home to the men that they must co-operate to the full in making their washrooms a credit to themselves and to the works.

Each station engineer, on the larger stations at least, should be given the opportunity to visit freely the major stations throughout the area in turn, not collectively on conducted tours, but individually, possibly when he meets some particular problem which has already arisen and been solved elsewhere, or when new plant under construction has reached a stage which may be of particular interest, so that some incentive is gained where there is room for improvement and the parochial outlook is broken down.

Safety Regulations

Although we are committed to work to the building regulations for example, we still get accidents, sometimes serious, due to various infringements such as the use of ladders insecurely fastened or having missing rungs, and the use of drums to stand on for various jobs above ground instead of proper scaffolding, with disastrous results. Any infringement of the safety regulations is potentially a loss of man hours and unremunerative expenditure on overheads.

A familiar sight is the use of purifier grids as temporary planking for men working on wet or soft ground, or for a runway for wheelbarrows. This practice has been handed down over the years from the time when grids were cheap and easy to obtain, but timber shortage and high prices

make it imperative that they should be stored under close control and used only for their proper function in the purifiers.

The correct use of bricks is not always appreciated to the extent that it should be. If common bricks are suitable for a particular job, then engineering bricks at 35% higher cost should not be used just because it is 'more convenient' or because there are more of them in stock. There are many such examples which no doubt will suggest themselves and it is here that the technical assistant going around the works day by day can make a valuable contribution to works management and economy, as well as the chances of his own promotion, if he will keep his eyes open and really 'see' instead of becoming so familiar with a poorer standard of supervision that these things are taken for granted.

So far as safety regulations on the gasworks are concerned, far more good can come from the keenness of all the technical staff who should be covering the terrain several times a day in the ordinary course of their duties than from the employment of safety officers at individual works who may do nothing else but study the regulations and try to get other people to enforce them.

Storage of Bulk Materials

To a great extent storage of bulk materials is allied to works tidiness; economical storage is based on the use to its maximum capacity of available stocking ground combined with the best use of stocking and re-claiming plant.

Straggling heaps are not only unsightly, but wasteful and costly because the best use is not made of the available space, measurement of stock is difficult and inaccurate, rate of re-claiming is slowed down, expensive plant is not used to maximum capacity, and inevitably there is degradation or loss of materials stored. How often we see ragged coal and coke heaps with the materials at the edges being crushed by the wheels of passing vehicles resulting in wastage, and in the case of coke heaps a higher breeze formation and lower revenue.

Stock yards should be concreted or well consolidated with hardcore; the disposition of the heaps and the hauling ways between should be carefully thought out and marked on the works plans before the stocking season commences. The use of such aids as the 'Stelcon' units should be encouraged where space is restricted, not only to maintain tidy stocking grounds and minimise degradation and waste, but also to speed up rate of handling, increase the stocking capacity of the space available, and minimise early deterioration in thermal value.

An excellent paper on this subject was presented at the 1951 meeting of the Institution of Gas Engineers which is worth the closest study, and in which experience at the North Thames works was tabulated to show that from tests on a particular type of coal it was possible to lose up to two therms per ton over six months which might have been saved by attention to compacting and the use of sectional walls for sealing the base of the heaps.

Foreign matter should not be allowed to find its way into heaps during stocking operations, such as sundry steel bars, bricks, paint cans, etc., which are all a potential source of danger. This has been brought home forcibly in our own area by a fatal accident which was directly attributable to a misunderstanding of the signal given to a lorry driver engaged in dragging a length of tee iron out of a coal heap, but which could not have occurred if the iron had not been in the heap in the first place.

Transport and Vehicle Accidents

Reference to the Board's annual report and accounts will show that since vesting date expenditure on the purchase of motor vehicles and mobile plant has amounted to £158,409. The policy underlying this expenditure has been to keep our transport fleet up to date and thus reduce maintenance and running costs; to mechanise material handling and thus reduce manual labour costs; to maintain adequate coke deliveries and thus promote coke sales; and last but not least to provide mobility for distribution personnel and speed up delivery of appliances and thus maintain the best possible service to the gas consumer.

All this is worthwhile only if the transport fleet is fully employed, efficiently and economically maintained, and properly organised. If this standard is not achieved then our transport will become a luxury we just cannot afford and it would have been better if we had placed our transport requirements in the hands of outside concerns whose sole job is to make transport pay.

In most cases, if not all, transport is maintained on the works, and while the procedure varies, some servicing on a shift basis and others on day work, etc., during normal working hours, no two like vehicles should be under routine service at the same time in the same depôt. Works staff should be vigilant to ensure that lorries, dumpers, and mechanical shovels are not standing in the works with engines left running; coke deliveries should be scheduled to achieve minimum 'no load' mileage—journeys to distant depôts should be arranged so that loads are carried on both outward and return journeys; suitability of drivers and their accident records should be constantly under review.

At present vehicle accidents due to an apparent lack of care or error of judgment on the part of the driver are at the rate of 11 per month in respect of vehicles licensed for the public highway, which averages one accident for every three vehicles per annum. Conversely this means that on average each vehicle is involved in one accident every three years, and if the owner driver will just consider the effect on his own insurance he will begin to appreciate the effect on the Board's insurance premiums, not to mention loss of working time where repairs have to be carried out, and the shortened life of the vehicle.

Making for Safe Driving

It may be that with the Board's entry into the National Safe Driving Competition the standard of driving will show some improvement, but in addition I would strongly recommend the following:—

(1) All vehicles to be fitted with driving mirrors both on the near side and the off side. (One accident in four occurs during reversing.)

(2) Stringent driving test by competent person when new driver is engaged. No new driver to be engaged who holds a conviction for driving offences or has recent endorsement to his licence.

(3) Arrange a check driving test once a year for every driver by a competent person.

(4) Brake test each vehicle brought in for normal service.

(5) In addition to mechanical inspection give equal attention to the operation of door catches and to body work generally.

(6) Allow coke lorries in exceptional circumstances only to enter drive to private house.

(7) Impress upon each driver the necessity for using his daily report sheet for any fault of the vehicle, however slight.

(8) Under no circumstances allow a vehicle to go out again without attention when faulty brakes or steering are reported.

(9) See that all loads are inspected before leaving the works (by the appropriate foreman or weighbridge attendant).

These are only a few pointers to the ways and means in which the number of accidents and the Board's transport costs can be reduced. As far as accidents are concerned, I would recommend that all personnel engaged with the control of transport and drivers should study the accident statistics for the whole area, giving the type of accident which is most

prevalent and the cause, and give particular attention to the identifying of accident-prone drivers, and also follow up where there may be indications that the vehicle servicing is not all that it might be.

Stores Issues

Any reference to savings and costs would be incomplete without mention of the stores since they are an integral part of the works functions and they cannot claim to be efficient if the method of issues is on a par with the village store in the Christmas pantomime.

In the first instance orders for stores should be concise, correctly worded and legibly written, and it should be impressed on foremen or any other staff authorised to indent from the stores that this is the standard expected; all the coding and card index systems in the world will not produce the correct item if the requirements are not presented in a form which can be correctly interpreted by the stores staff. Time saved is time, and hence money, gained, and a quick turn round is therefore essential.

On the stores side, the storemen should not necessarily be chosen from the ranks of the quota of registered disabled or 'light' workers, but should have some measure of intelligence as a qualification and an aptitude for memorising parts of individual plant and the difference between one item and another besides being able to identify one metal from another.

It should be impressed on the men selecting and issuing stores that waiting time at the goods outwards hatch must be kept down to the minimum and it almost goes without saying that craftsmen should not themselves be expected, or in fact be allowed, to present orders to the stores except in special circumstances; walking time to and from the stores and even the minimum waiting time should be incurred at the lower wage rate of the craftsmen's mate or apprentice.

On the works side job organisation by the respective foremen on maintenance and installation is just as important as it is on the district; consumer service would be prohibitive if gas fitters were constantly running back to the distribution stores, like the proverbial plumber, for tools or the bits and pieces overlooked when their job was first arranged. While on the subject of craftsmen and mates, it may be appropriate to mention the diversity of practice in the area; from our periodic surveys of manpower, it appears that in the Northern division the ratio of mates or apprentices to craftsmen ranges from 1:1 to 1:4, while in the Southern division it is from 1:2 to 1:6. This is worth investigating to see if there is a standing order on the yard for craftsmen's mates and which is not possibly essential throughout the year.

There are many other points on stores organisation which reflect efficiency and economy such as segregation of light and heavy material and of spares for various plant, methods of storing items which are subject to a high rate of deterioration, duplication of spares versus standardisation, the continual clearance of obsolete materials or spares for plant 'long since departed'; arrangements for receiving and inspection and so on; in fact, a paper could be devoted to this subject alone, but we now have an area committee which is investigating stores procedure generally and no doubt all these points and many others besides will emerge in due course.

Purification—Commercial Aspect

With the approaching relief of the sulphur shortage the time is opportune to consider the results obtained from oxides with a view to making available to the sulphuric acid manufacturers a product which, with the highest possible sulphur content, can claim an increased revenue now and establish a market for future years.

The overhaul of purification methods and the exchange between sub-divisions of data collated at the major stations is evidently worth while when one considers that on present prices one ton of new oxide will be worth when spent £6 16s. 11d. at 46%, £8 19s. 8d. at 50%, and £10 at 52% sulphur (wet basis). Allowing railway rates at a constant figure the difference of £3 3s. 1d. per ton between 46% and 52% is evidently worth considering and warrants investigating and comparing our many works records which must be available on types and performance of various oxides, rotation of boxes, use of grids, temperature and humidity control and direction and speed of gas flow.

As more sulphur becomes available both from abroad and from the petroleum refineries in this country, tests will be more stringent, and if we are to avoid in future years being in the onerous position of having on our hands thousands of tons of material which nobody wants and which may not even be dumped on refuse heaps we should turn out the best possible product now so as to obtain the higher revenue while it is offered and be better able to meet competition when it comes again in the future, or even to have a product which it may be economical to process by our own plant if other attempts at disposal fail.

Plant Maintenance and Depreciation

The continued rising costs of new plant and renewals make it imperative that plant shall be properly maintained and shall be capable of operating at the lowest possible cost during the life over which it is depreciated.

The control of maintenance costs can best be exercised by a system of 'preventive maintenance' incorporating not only the planned overhaul of the major plant—carbonising, carburetted water gas, boilers, coal and coke handling, etc., but also the daily, weekly, monthly and quarterly routine inspection and repairs necessary for the innumerable smaller items such as gasholder carriages, retort house governors, electrical switch gear and motors, exhausters, pumps and so on.

The owner of a private car invariably has the vehicle attended to on either a mileage basis or at regular monthly intervals, the work carried out being in accordance with a standard form of maintenance chart so that satisfactory running and a long life is obtained. Where this system, or similar, is not in use, I would strongly recommend its adoption, at least on all the larger works starting with a schedule covering the appropriate items of plant and setting out against each the routine inspection, renewals, cleaning, etc., found to be necessary from past experience, or in some cases after consultation with the manufacturers.

When such a system is established, it is of course essential that the routine inspection and maintenance be carried out even if the item of plant seems to be running satisfactorily, because by so doing—

(1) Unseen wear and tear is minimised.

(2) The plant, like the private car, will operate at optimum efficiency.

(3) Emergency repairs are kept at a minimum.

(4) The work of the maintenance staff can be planned, overtime obviated and numbers employed maintained at a minimum and more constant level.

(5) More exact costs of maintenance can be recorded and made available for study which will be invaluable when the purchase of new plant and machinery is under consideration.

The alternatives to preventive maintenance can only be waiting until something breaks down and the work then has to be done probably at some inconvenient time and possibly at the expense of gas output, or a rough and ready method of working from peaks of considerable activity to the shallows when everything seems to be running satisfactorily and there is time to take stock and set the maintenance staff on inspection and renewals of items which it is thought might tend to give trouble.

Coincident with preventive maintenance, works fitters should not be employed always on specialised work. By this I mean that one fitter should not be designated wholly for boiler and steam work, another for pumps, one for exhausters

and so on. The fitter's job is more interesting if a variety of work is carried out, and at the same time it increases the usefulness of each individual craftsman and widens his experience; one works fitter once told me that since nationalisation his job was not nearly so interesting because each fitter on his particular works was now allotted certain plant; apart from the psychological aspect it may be against the Board's interests, because if a breakdown occurred after working hours and the fitter who normally dealt with the particular item of plant was not available, the repairs would be delayed or another fitter not completely conversant with the plant would have to do his best to get over the difficulty.

So far as maintenance records are concerned, a standard form of plant record such as the 'Kalamazoo' or the 'Shannon' systems is desirable, and would bring to the notice of all concerned the life expected and indeed catered for in the Board's accounts and provide the essential information on any item for easy reference. Preventive maintenance of building and civil engineering work is equally essential.

Apart from the works buildings the Board owns a great amount of property in the form of private residences, offices, and showrooms, distribution depots and so on, and the alternatives are either to wait until we are just forced to bring in building contractors to carry out major repairs, or to carry out day to day maintenance with our own staff. For example, gutters, drainpipes, roof covering, pointing of brickwork, and windows, all require constant attention if property is to have a long life and is to avoid that appearance of neglect which is so often the forerunner of early demolition or very costly repairs.

Ideas and Improvements

The man usually best fitted to effect improvement in routine works processes resulting in economies is the man on the job who can study a problem day by day—from the craftsman to the station engineer—and while we have had just a few ideas brought up from time to time for the information of other sub-divisions, I cannot help feeling that there must be many small improvements effected at one works which would be of interest to the rest in the area. Some examples I have in mind in the Northern Division are:—

Bristol. Economy in the use of recorder charts by saving old charts say for 3 or 6 months and then re-using and recording with a different colour, thus reducing the cost by a half.

Bath. Use of refractory concrete for making sight hole plugs and damper tiles effected a saving, for example, of 28s. 4d. in every 13 damper tiles used.

Bath. Conversion of mechanical shovels, etc., from petrol to vaporising oil. The conversion cost about £30 per machine and the savings effected amounted to nearly 60% of the fuel costs.

The works staffs should be given every encouragement to use their initiative and ingenuity for the benefit of the area, and I see no reason why our annual *News Sheet* should not make reference to the results of adopting each idea as well as publicising the economies effected on the more impressive items.

Staff

There are three main qualifications which the individual must possess in order to make his contribution to the efficient and economic operation of the works on which he is engaged —*viz.*,

(1) Ability to carry out his duties to the full.

(2) Correct mental approach to the job in hand.

(3) Capacity to work with, rather than against, other members of the staff with whom he is in contact.

I have heard it said on more than one occasion that successful management consists of 10% practicalities and 90% personalities, and there is no doubt there is more than a grain of truth in this definition. If a high standard is to be both attained and maintained, each individual must play his part, and staff organisation and control must be directed to this end, re-adjusted if necessary from time to time to meet any unavoidable changes following in the wake of nationalisation of the industry or within the scheme of administration in our own area.

The first qualification is obvious and needs little comment since the individual may be either appointed on his known qualifications and experience or, in some cases, after a successful trial period in the line of promotion. Under the Gas Act it is the duty of the Board among many other things to 'make provision for advancing the skill of persons employed by them,' and our Board's education scheme has been set up to meet this commitment and to determine a line of promotion. However, there must be some constant measure of vigilance to ensure not only that the individual's abilities are best used both for his own sake and for the Board's benefit but that he also makes his contribution to his own salvation.

A works chemist who may show a flair for directing labour and getting jobs done should be given the opportunity of moving out of the chemical department and taking part in general works supervision since it is easier to train chemists than leaders. Again, a technical assistant may show aptitude for investigation into plant operation and results and have considerable ability in this direction while at the same time lacking the ability to organise and control some particular operation or process, and he should be encouraged in plant research.

The technical staff on any one works is relatively small in numbers as compared with, say, the clerical staff at a sub-divisional office so that the opportunity to study the individual abilities and capabilities is more pronounced and the station engineer is well placed to exercise staff organisation in this way, but I believe it should go further than that; it should go to the extent of giving advice if vacancies occur at other stations which may suit an individual's particular qualifications and experience. For example, vacancies advertised some little time ago for works chemists and assistant station engineers met with a poor response from the South Western area. Is this because there are no chemists and technical assistants in the area with any ambition to improve their status (and this is hard to believe) or is it because they are in a 'rut' and tend to lose their self-confidence in the absence of opportunities to take on some measure of responsibility?

The Question of Approach

Under the second heading a lot can be done by passing down the line the reasons for any apparently inexplicable activities. The correct mental approach can never be attained if there is not a full appreciation of why something has to be done, or why certain information or records must be compiled, and so on.

It may be just as important that one individual should know why another is engaged in some direction which on the surface may appear to him to cancel out the usefulness of his own work. Water-tight compartments are to be deprecated although this should not be inferred as being derogatory to the use of specialists either in the gas industry or any industry for that matter, but even a specialist is an expensive luxury if he lacks the capacity of working with the rest of the team.

One further point which should be borne in mind is that management and organisation are not necessarily defined by the expression 'team work' since although this may be an essential the basic principle of employer and employee must be preserved. There must be someone to say what is to be done and to fix the responsibility firmly for ensuring that instructions are carried out all the way down the line of authority.

A most useful purpose could be served by occasional meetings of all production engineers in the area to discuss new ideas, exchange information on improved processes, compare plant manning and man-power records, look into anomalies in working results and cover from time to time some of the

(*Concluded on page 107*)

Meeting the Challenge

By W. G. PHILLIPS, M.A., A.M.I.C.E., M.Inst.Gas E., M.Inst.Fuel,

Commercial Manager, Watford Division, Eastern Gas Board.

Paper to the London and Southern Junior Gas Association

THE long awaited report of the Ridley Committee on National Fuel Policy was published last September and some of its findings certainly surprised many who were confidently prophesying that the Committee would recommend an over-riding authority to lay down clearly defined spheres of action in the fields of domestic and industrial fuel utilisation for the gas and electrical industries.

Let us turn to the reactions of our electrical competitors to this report. In the *Electrical Times* of September 11, 1952, we read: 'Contrary to some expectations, the long-awaited report of the Committee on National Fuel Policy for the use of Fuel and Power Resources (the Ridley Committee) makes no violent attack on any particular fuel . . . . ," and again in the Editorial of the *Electrical Times* of September 18: 'Perhaps the first reaction to the Ridley Report will be one of relief—it might have been worse. Electricity's main platform "freedom of choice" has been held against all those cranks who aimed at foisting on the public their own particular brands of fuel planning. Secondly, the arguments in electricity's favour are all included, even though most are mentioned among the "other relevant technical factors" and may thus be lost to sight in subsequent over-simplified abstracts.' There is no doubt that the electricity supply industry has breathed a sigh of relief at this report. 'It might have been worse'—indeed it might have been very much worse.

This 'Appropriate Framework'

While on the other hand many in the gas industry will welcome the Committee's recommendations that 'within an appropriate framework of prices and tariffs competition between the gas and electricity industries should continue'[1] and '. . . . we see real value in the zeal which the boards and their staffs display for their own product, and in their belief in the benefits which it can confer on the community;'[2] they will at the same time consider that the claim by the industry that the use of gas and coke for the provision of heat services results in the lowest possible expenditure of basic coal has not been heeded to the extent justified by the evidence. The Committee has concluded that the overall conversion efficiency expressed in terms of basic coal requirements of electricity for room heating is similar to gas. Such a conclusion, which will astonish many, was supported by the evidence given by the industry when a figure of 47.2% was quoted as representing the efficiency of gas production and distribution. This figure was computed on the basis of debiting against the gas yield the whole of the fuel used in the carbonisation process and ignoring the thermal value of coke, etc., which are also in the products.

The report, including the appendices, covers some 235 pages, 117 of which consist of the evidence submitted by the fuel industries, the Federation of British Industries, and the Trades Union Congress. Let us look at some of the evidence submitted by some of these bodies, who could not be said to have a bias towards either gas or electricity. The National Coal Board points out that for lighting and mechanical power electricity is uniquely suited and practically irreplaceable; for space heating, water heating, and cooking it competes with all other fuels and could easily be replaced. The National Coal Board goes on to say that at present nearly four-fifths of the heat content of the coal is lost in the conversion while the capital equipment needed for the purpose is such that the ratio of capital employed to annual turnover is higher than in most industries.[3] In regard to the off-peak load, the Board states that 'if the electricity supply industry is seen as a "secondary" fuel industry, which converts scarce coal into a highly refined fuel at the cost of losing nearly four-fifths of the original therms, then the traditional policy of developing the off-peak load needs to be reconsidered from the point of view of coal utilisation. There appears to be a serious and fundamental conflict between the argument of commercial efficiency—which demands the greatest possible heating load for electricity during off-peak hours—and the argument of thermal efficiency.'[4] The Board states that it is driven to the conclusion that the use of electricity for space heating, water heating, or cooking must in present conditions be considered as generally incompatible with the national interest.[5]

The Electrical Heating Load

The Board states that not only should any further growth of the heating load of electricity be prevented but most strenuous steps should be taken to reduce it by means of a large-scale conversion of consumers' appliances, pointing out that over 80% of electricity consumers' premises are already piped for gas.[6] On carbonisation the Board states that for 'intermittent' heating little if anything is gained if jobs now done by electricity were taken over by solid fuel. In the Coal Board's own words: 'The obvious choice is gas—gas can be stored, the gas industry does not face the same peak load problems as electricity and the capital costs of gasworks per ton of raw coal used are only about 40% of those of electricity works.'[7] The Board's evidence continues: 'If more gas is made, there will also be more coke, which is an extremely suitable fuel to replace electricity on continuous heating jobs. In some respects, coke has advantages even over raw coal. Coke in stock presents no dangers of spontaneous combustion. Ordinary coke is much less easily burned in the old-fashioned open grate than raw coal, and if coal supplies continued to be short while coke supplies were greatly expanded, many consumers would thereby be forced to abandon their inefficient grates and replace them with new appliances. Also coke burns without smoke; while it is true that bituminous coal can be burned smokelessly if used in an efficient appliance properly attended, there is no certainty that it will be so used. With coke, the certainty is virtually complete.'[8]

In the evidence submitted by the Trades Union Congress there appeared the following: 'There is a shortage of electricity, which causes not only inconvenience and hardship but also wasted manpower and economic loss; yet it is evident that electricity is being used for purposes for which its overall thermal efficiency is low, in many cases because the real cost of the supply is not recovered from the users.' The memorandum goes on to state that an important element in a national policy must be to encourage coal carbonisation as part of a policy of using coal economically and that what can be done in this direction depends on the capital investment and expansion of gasworks, which should receive a very high degree of priority.[9] In regard to domestic consumption of gas and electricity and the principle of freedom of choice, the Trades Union Congress make this point: 'In some directions this freedom of choice has already been limited—*e.g.*, by the installation of particular types of equipment in new council houses and by the provision of electric or gas cooking appliances. But generally the gas and electricity industries regard the field as one for free competition. However desirable consumers' choice may be in principle, the fact that our fuel and power resources are limited means that individual likes and dislikes may at some points have to be over-ruled

by the needs of the community, and the general availability of alternative fuels limited. It would, for example, be justifiable to protect the electricity peak load by preventing the further development of all-electric estates."[11] On tariffs the memorandum states that the British Electricity Authority's attitude is one only of sales promotion and little account is taken of peak load problems arising out of offering additional supplies unconditionally to consumers at low marginal cost and then applying for more capital investment to meet the demand."[12]

Lack of Fuel Policy

There is little in the report that has not appeared in the reports of the Simon Committee and the Egerton Committee and in papers and discussions of professional bodies. The Ridley Committee has not propounded a national fuel policy but has recommended the freedom of choice of fuels to the consumer 'within an appropriate framework of prices and tariffs' and within that framework 'competition between the nationalised industries will be in the country's interest.' In the debate in the House of Commons which considered the report an M.P. well-known for his active interest in fuel economy said: 'The fundamental fallacy of the findings of the Ridley Report is that it fails to give any indication of what is the best use that can be made of any particular fuel or power product . . . .' As to the use of electricity for space heating, a former Minister of Fuel and Power said: 'Government and Parliament should consider whether for the next period of years domestic heating will not be a curse to the British Electricity Authority and whether in the national interest we ought not to seek by more positive and active measures to promote the use of gas.'

There is much in the report which the electricity supply industry will no doubt emphasise in putting a case to the public that the use of electricity is best in the interests of the nation. The following statement is an example, and was made by the Chairman of the Eastern Electricity Board to the Eastern Electricity Consultative Council: 'The Ridley Report emphasised that the more the domestic consumers employ electricity for cooking, water heating, and other purposes, the larger our load factor becomes and consequently the more we can spread our overhead charges over a large number of units to the benefit of the consumer.' The old story of the electricity generating stations burning low grade fuels which other users find difficult to employ providing a market for 'fines' and 'smalls' and thus helping to utilise the whole coal resources of the nation will be rehashed in this or similar guise. No less an authority on fuel utilisation, Mr. Oliver Lyle, had the answer to this one when in the course of the discussion on 'The Supply and Effective Use of Electricity' given by the Chairman of the Eastern Electricity Board at the Combustion Engineering Association's Conference on 'Meeting the Fuel and Power Shortage,' in October, 1951, he said: 'It was no use the B.E.A. saying that they were the only people who could burn so-called unburnable fuel. Every big factory had the same kind of boilers as the B.E.A. and many of them had much better ones. Anything the B.E.A. could burn, those factories could burn."[13]

The gas industry will not cavil at the decision, if accepted, that within the framework of tariffs and prices there should be competition between the nationalised industries. Indeed there are already signs that the present uneasy restrictions on various aspects of promotional advertising between the fuel industries are about to break their bonds asunder. We shall do well not to forget the words spoken by Lord Citrine, Chairman of the British Electricity Authority, when he referred to the B.E.A.'s intention of 'having a go' at 'State gas.' There should be no woolly thinking on this point. State electricity are hoping to make big inroads into loads now largely held by State gas—as an instance one hears of a target of 50% of the cooker load in new dwellings. Is the gas industry ready to meet the heavy sustained and well directed attacks that State electricity will undoubtedly release on it? There is no doubt that our industry has a sound heart and is in good fettle but enhanced preparations and greater efforts to meet this competition must be intensified and speeded up. Years of frustration, shortages of appliances, Ministerial restrictions on sales promotional activities, etc., may have tended to produce an attitude of mind inconsistent with the necessary high standards of consumer service among many of the personnel in the industry who come into contact with the public; indeed there must be many engaged on the sales side of the industry who have never experienced real selling.

Notwithstanding all these signs of strenuous times ahead there is no reason whatever why our industry should not be capable of meeting this second onslaught with the same success as the first was met. I refer to the early 'thirties when the electricity grid system came into being. With all its glamour electricity supplies were going to spread to the remotest hamlet; everything was going to be all-electric; electricity was modern; it was the 'latest thing.' What happened? Electricity certainly made inroads into some loads, particularly domestic lighting in areas where electricity was being introduced for the first time. Some of the smaller gas undertakings without the financial resources to meet this competition were undoubtedly saved by the holding company movement which established parent companies able to raise capital on much more advantageous terms than purely local undertakings and were able to place at the disposal of their subsidiaries technical advice which otherwise could not be afforded and also to obtain better terms for the bulk buying of appliances, coal, and other materials. As a whole the effect of this competition on the industry acted as a catalyst. Much more attention was paid to the sales activities of gas undertakings than had hitherto been the case. The result was that the industry forged ahead consolidating its hold on existing loads and at the same time acquiring new ones. This was particularly marked in the application of gas to industry.

Supply and Demand

The Heyworth Committee which reported in 1945 on the structure and organisation of the gas industry, forecast an increase in sales to all types of consumers of at least 20% in the next 10 years.[14] In actual fact there has already been an increase of 36%. Of industrial demands for gas it is said: 'We have, however, had evidence that gas has gained greatly in its reputation with many industries during the war, and there are in our view good prospects of an expansion of its use industrially, both through the conversion of existing processes and from the gas industry securing a share of new heat requirements. On the whole, therefore, we think that, after the inevitable decrease of the post-war period, the gas industry will have a good opportunity of raising its industrial sales within the next decade to the level which they reached during the war."[15] In actual fact, the Gas Council's third report shows an increase of 35.5% over 1943. In a number of areas, due to lack of plant capacity, some demands for gas from industry are having to be refused. In the West Midlands area alone the deferred load since vesting day amounts to the extent of some 6,000 mill. cu.ft.

DOMESTIC UTILISATION OF GAS

Cooking

The domestic cooker is the appliance of the first importance to the industry. Just under 60% of the existing supplies of gas are taken by domestic consumers[16] and 65% to 75% of gas used for domestic purposes is used on the cooker.[17] The Heyworth Committee referred to 'losses which the industry may have to face in the domestic lighting and cooking fields'[18]. What is the position today, over seven years after that report was written? Our electrical competitors, encouraged by a tendency on the part of local authorities in a desire to be fair to both industries, oblivious of tenants' choice, to allocate the cooking and laundering loads in the prefabricated houses on a 50% basis to gas and electricity and further encouraged by some surveys, which indicated that there might be a preference for electric cooking, loudly trumpeted the decline and fall of

the gas cooker. Today, however, the gas cooker is as popular a favourite as ever it was. In the discussion on the paper, 'The Gas Industry's Contribution to the Fuel Services of the New Towns'[19], given to the recent Public Works and Municipal Services Congress, the author's reference to three out of four tenants in the new towns choosing gas for cooking was severely criticised by a number of speakers as being much too low.

Electric Cooking Load

Let us see what our competitors say about this situation. In the Editorial of the *Electrical Times* of November 20, 1952, under the heading, 'Eclipse in Cookers,' there appears the following: 'Immediately after the war the prospects for electric cooking looked particularly bright. Pre-war experience had more than shown the way, personal surveys confirmed the domestic preference for electric cooking, and with a vast housing programme on hand the future looked assured. Then came the slump. The most conservative estimates of cooker sales proved over-optimistic and manufacture had to be geared down. Not only did housing fail to reach its target but, far more vital, electricity has commenced to lose its hold in this field. The basic virtues of electric cooking have been discounted in the public mind and if evidence of this is required it is to be found in the latest report of the Gas Council. Out of 53,000 new houses erected during the year, no less than 80% of the occupiers chose gas for cooking. Unquestionably the Gas Council have put forward the more favourable examples to proclaim their case, but as this quoted example amounts to well over one-quarter of the total new houses built, the inference is only too clear.

'Why have electric cookers failed to make the progress that they deserve? The higher price relative to gas is no new feature; this differential existed before the war when the demand for cookers was rising. The adverse publicity on load cuts may have over-influenced the public, but surely this alone cannot be responsible for the change in public sentiment. What has been lacking is the hard slogging commercial drive of the pre-war days. Such a drive has been difficult for area boards to emulate; the shortage of plant seems to have entered into the soul of some of them, and over all lies the restrictive hand of the ministerial embargo on promotional activities. Within this limitation, however, it is difficult not to feel that more could have been done. A similar embargo has been placed on the Gas Council, yet this did not halt the recent widely publicised display with gas cooking at the Festival Hall or the several broadcasts associated with it. What if the embargo were lifted —there is at least some talk of it—would the supply industry be ready to take full advantage of the new freedom, ready with the necessary programme of publicity? On their present showing they would be left at the starting post.'

Danger of Complacency

The 'grass is always green over the other side of the hill,' but the industry, while having reason to be satisfied with the results so far obtained will not fall into the error of becoming complacent. There may be localities up and down the country where the tenants' choice is not as high as 80%—no effort should be spared now to ensure that these are brought up to at least this figure. It is interesting to note in one of the post-war surveys referred to above that in the case of the tenants choosing electricity for cooking in about half the cases the 'preference is not related to actual experience and is possibly due to publicity'[20]. It is difficult not to accept the fact that before the war the sums spent by the gas industry on publicity in all its forms were exceedingly small when compared with other industries of a comparable size. Even during the present restrictions it might be said that something more could be done without infringing the principles of promotional advertising for the fuel industries which have been laid down by the Ministry of Fuel and Power for the last two years. Further reference will be made to this most important subject of publicity later on in the paper.

New designs of gas cooker which have come on to the market since the war show that both the industry and the manufacturers are constantly seeking improvements in both operational and thermal efficiency (*viz.*, the Gas Council's advertisements—three therms of gas now do the work of five in many of the older models). A welcome trend has been the departure from hitherto accepted standards of styling exemplified by cookers fitted with 'eye-level' grills and a cooker having a cantilevered hotplate, with rear boiling burners out of centre with the front pair, which has overall dimensions differing from the oven. Development work on the domestic cooker will go on to improve its efficiency, method of ignition, and ease of cleaning, the last point being very important in view of the fact that where housewives do choose electricity for cooking the main reason often is cleanliness—the hotplate cleaned by a wipe of the cloth after cooking, and the cleanliness of the oven.

A further field of development is suggested in the appreciation of the heat storage principle to a continuous burning insulated thermostatically controlled combined gas water heater and cooker.

Saving of Labour

Nowadays fashions are affecting more and more articles of everyday use. The kitchen is the focal point of the housewife's domain and it is where she spends most of her time. She demands a light, airy space with plenty of cupboard room, a reasonable amount of space to work in, plentiful supplies of hot water, and a modern cooker as the centre-piece. It is often asked, are we too staid in our designs? Are our standards which the appliances have to pass before approval for general sale to the public unnecessarily exacting? Should there not be more gadgets on the cooker—an oven light operating on door opening, a clock incorporated above the hotplate? Today America sets the fashions of many of these articles, automobiles coming at once to mind; and this influence can be seen in gas cooker design, particularly in regard to a range recently put on the market by one of the largest manufacturers in the country. America is also, whether our pride likes or not, regarded as the Mecca of Mass Production and Full Mechanisation. Our electrical competitors point out the difference in the use of electricity for power purposes between the two countries, the estimated figures in 1950 being 7.5 H.P. and 4.7 H.P. per operative in U.S.A. and U.K. respectively[21]. There is a popular idea held, I believe, in many quarters that the American housewife has more labour saving and mechanical aids in her home compared with her British cousin, the inference often being that the house is all-electric. It is felt that the following statistics will be of interest:

BUREAU OF LABOUR STATISTICS (1949/50)[22]

Area	No. of Domestic Units	% of All Units	% Gas Cooking
Baltimore	316,000	97.8	91.6
Boston	415,000	98.2	88.4
Chicago	1,284,000	98.2	93.4
Detroit	707,000	98.0	81.0
Los Angeles	1,299,000	96.3	91.6
Minneapolis	278,000	94.2	84.5
New Orleans	180,000	95.6	80.2
*New York City	2,336,000	98.0	97.5
Philadelphia	676,000	97.6	90.9
Pittsburgh	358,000	98.6	94.2
St. Louis	372,000	98.0	84.1
San Francisco	535,000	95.8	92.5
Washington	354,000	97.5	86.9

* City proper, not Metropolitan area.

The above information is indicative of the very high saturation of gas cookers in the big cities in the U.S.A. Overall gas is the main cooking fuel in 73%, electricity in 5.1% and solid fuel in 14% of the houses in urban areas[23]. It is suggested that publicity should be given in this country to this very pronounced American preference for gas cooking, more especially as the American way of life is increasing in popularity in the U.K. These remarks apply in a lesser degree to the other uses of gas—*e.g.*, for water heating gas is used to the extent of 60% of all urban houses and electricity to about 3% of all houses[24].

(*Continued on p. 103.*)

THE
Flavel
68
Fawn
GAS
COOKER
THE POPULAR 'BOWFRONT'
COOKER IN AN
INEXPENSIVE NEW COLOUR
SIDNEY FLAVEL & CO. LTD - LEAMINGTON SPA
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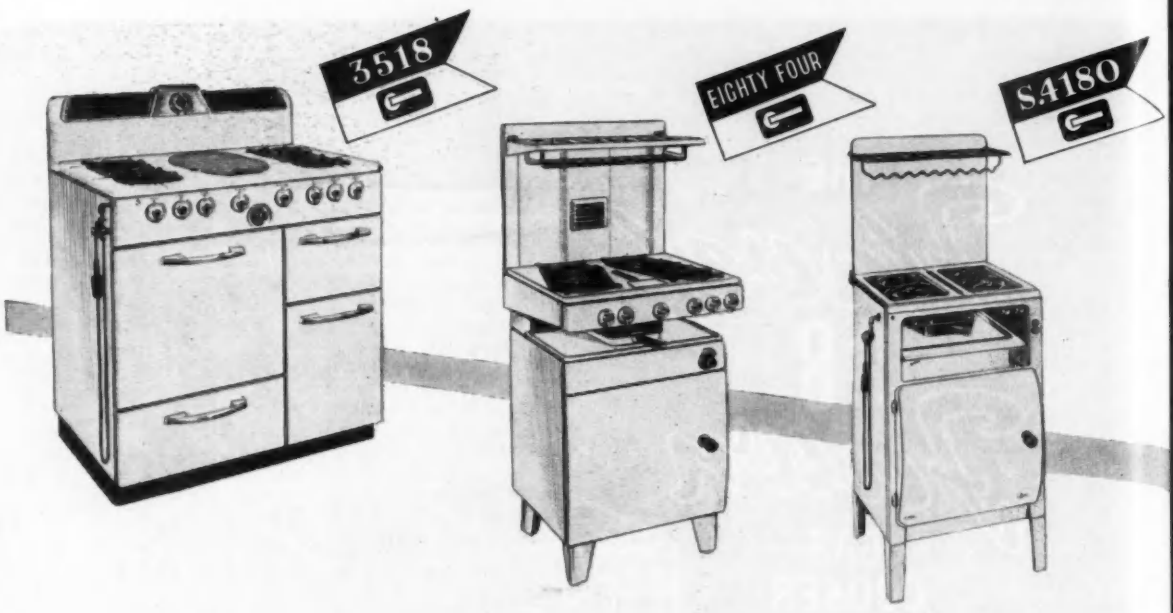
FLAVELS



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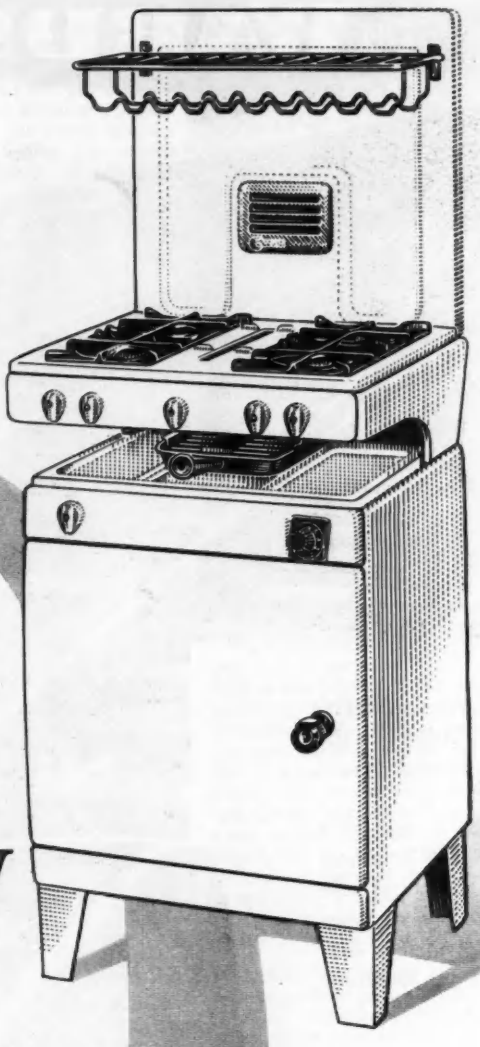

...the Seventy Five

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NEW WORLD NEW WORLD NEW WORLD

SIDINGS by WARDS

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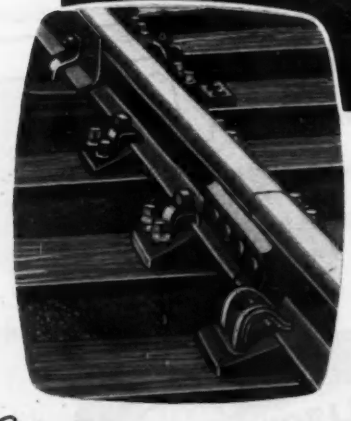
Wards have been building sidings for a variety of operating conditions for almost half-a-century and thus bring to the subject an extensive knowledge of every aspect of railway siding planning, construction and maintenance for industrial usage.

Those who are concerned with the operation and maintenance of private railway sidings will find much useful information in the second edition of our booklet. "Rails and Rail Accessories." Copies forwarded on request.



109 lbs. F.B. rails are used throughout this siding. The inset shows the detail of fastenings for this type of rail.

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SC/25

Solid fuel appliances have undoubtedly made the greatest strides of all three fuels during the last 15 years, in both appearance and efficiency. This is largely due to the solid fuel appliance manufacturers and to such bodies as the Coal Utilisation Council who, incidentally, now have taken over the job from the Ministry of Fuel and Power of compiling lists of approved solid fuel appliances which the local authorities have to install in the houses they build to qualify for subsidy. The solid fuel interests are competing with the gas industry even in cooking. If one is sceptical of such a statement, perusal of a paper such as that recently given to the North Western Salesmen's Circle, 'Focus on Selective Selling,' in which evidence was given in the section, 'Solid fuel—an old competitor in a new guise,' of the strong competition of the solid fuel cooker on new housing estates will perhaps emphasise this point. In spite of this competition we show solid fuel cookers on our exhibition stands and test these cookers in our appliance laboratories while the self-same cookers are competing against the gas cooker not only in the North, but in the South of England.

Water Heating

The Heyworth Committee, when considering factors affecting the trend of the demand of the industry, stated that to offset any loss that the industry might incur in regard to the lighting and cooking load in their view the most favourable prospect lay in the development of intermittent water heating, which was likely to be mainly a summer load since in the winter months the great majority of the householders must for reasons of cost depend chiefly on solid fuel to heat their water. This potential load was substantial . . . . it might in time equal the present cooking load[25]. So far as the Committee's reference to the use of solid fuel in winter is concerned, this pattern has largely been followed in new housing since that date and indeed conforms with the recommendations of the Simon and Egerton committees which followed. Unfortunately as yet there has been no corresponding development in intermittent water heating by gas to the extent envisaged by the Heyworth Committee.

The potential field is enormous in both new and existing housing. As to the latter, one only has to read a report such as 'An Enquiry into Domestic Hot Water Supply in Great Britain,' which showed that 15% of the households had no water supply while in 28% of the households the copper is the one and only water heating appliance[26]. Incidentally, among the piped appliances the immersion heater was thought satisfactory by the highest proportion. It is of vital importance for two main reasons for the industry to capture this load in which there is every indication of a trend towards electricity. It is imperative to increase the consumption per consumer of the new estates which are being provided with gas supplies at two to three times the pre-war capital cost, if these new consumers are to bear their fair share of the costs; and, secondly, to increase the demand for gas in the summer and so help fill in the valley on the production graphs with the attendant benefit on spreading the costs of the space heating load, especially the peak load.

Incidence of Capital Costs

Why has the gas water heating load in the new houses not developed as was expected? High capital costs (including purchase tax) and the modern high efficiency of solid fuel appliances have been the two factors which have prevented this development. The Government-sponsored solid fuel grates which provide space heating and hot water have been installed in their thousands and electric immersion heaters (or provision for their fixing) have been fitted as a summer alternative on account of their lower capital cost and ease of fixing. Whatever we may say about coal economy, stratification, cheaper running costs—these factors have little weight with the authorities responsible for giving the decision as to the system to be installed compared with the over-riding question of capital cost. There have been very worthwhile developments in the water heating field during the last few years; the balanced flue heater, the U.D.B. heater, the use of materials with greater corrosion resisting properties—to name a few; but the industry and the appliance manufacturers must seek every conceivable means of producing equipment at such a cost that when installed it is competitive with the immersion heater.

Dual Fuel Appliances

The back boiler conversion units and the finned back boiler with gas attachment are excellent beginnings but they should be considered only a stage in the development of dual fuel appliances which are so badly needed today. It is suggested that development should proceed along the lines of producing a solid fuel appliance of the finned back boiler type with a gas burner as an integral part of the equipment and not detachable as at present. The arrangement of the system should be such that both bulk and small quantities of hot water could be provided at substantially higher efficiencies than at present obtained. It is appreciated that it is one thing to write down requirements such as these on paper and quite another to provide an appliance to fulfil them, but the need is so urgent and is of such tremendous importance to the industry that no effort should be spared in endeavours to find solutions to these problems.

Apart from the back boiler conversion units it would seem that investigations into the possibility of fixing a moderate or low consumption gas-fired immersion heater into the actual water storage cylinder in the airing cupboard would be well worthwhile. It may well be that such investigations are already in progress, and if that is so it is to be hoped that they will soon show that it is worthwhile to carry out a district test in selected installations.

The Potential Load

Notwithstanding the importance of developing the water heating load in the new estates and new towns which will be built in the next 15 to 20 years, the potential load which has previously been referred to, in existing property, should not be lost sight of. To tackle this load the industry should carry out some market research in order that a proper evaluation of this load may be made and the necessary sales campaigns prepared. It is appreciated that purchase tax, the Hire Purchase and Credit Sales Agreements (Control) Order, 1952—and to some extent present-day installation costs, which must be reduced by methods such as the jig fitting for sink heaters—militate against such a proposal, even if the present ban on promotional activities were rescinded, but it is never certain when these restrictions will be removed, and the industry should be prepared for when this situation arises.

Mention here should be made of the welcome development that has taken place in the gas heated, electrically agitated washing machine. It would appear that in the past the gas industry has been reluctant to use electricity for this purpose, relying on the hand agitated machine to meet the needs of its consumers. While there will, of course, continue to be a market for the hand-operated machine, it is felt that there should be a very considerable expansion in the sales of both mechanically agitated and wrung machines, particularly when the present restrictions on selling are lifted. Under present-day conditions of high personal taxation and ever mounting laundry charges, there is an increasing tendency for the housewife to do more and more of the weekly washing in her own home, and up to the fairly recent introduction of a mechanically agitated gas washing machine, the power operated washing machine market had been captured by electric washers, although most of these had to be supplied with hot water from an external source.

Space Heating

In recent years the necessity for the electricity supply industry to shed load has brought into great prominence the space heating load and its effect on the electrical generating and distribution systems. There has been much discussion in the

(*Continued on p. 106*)

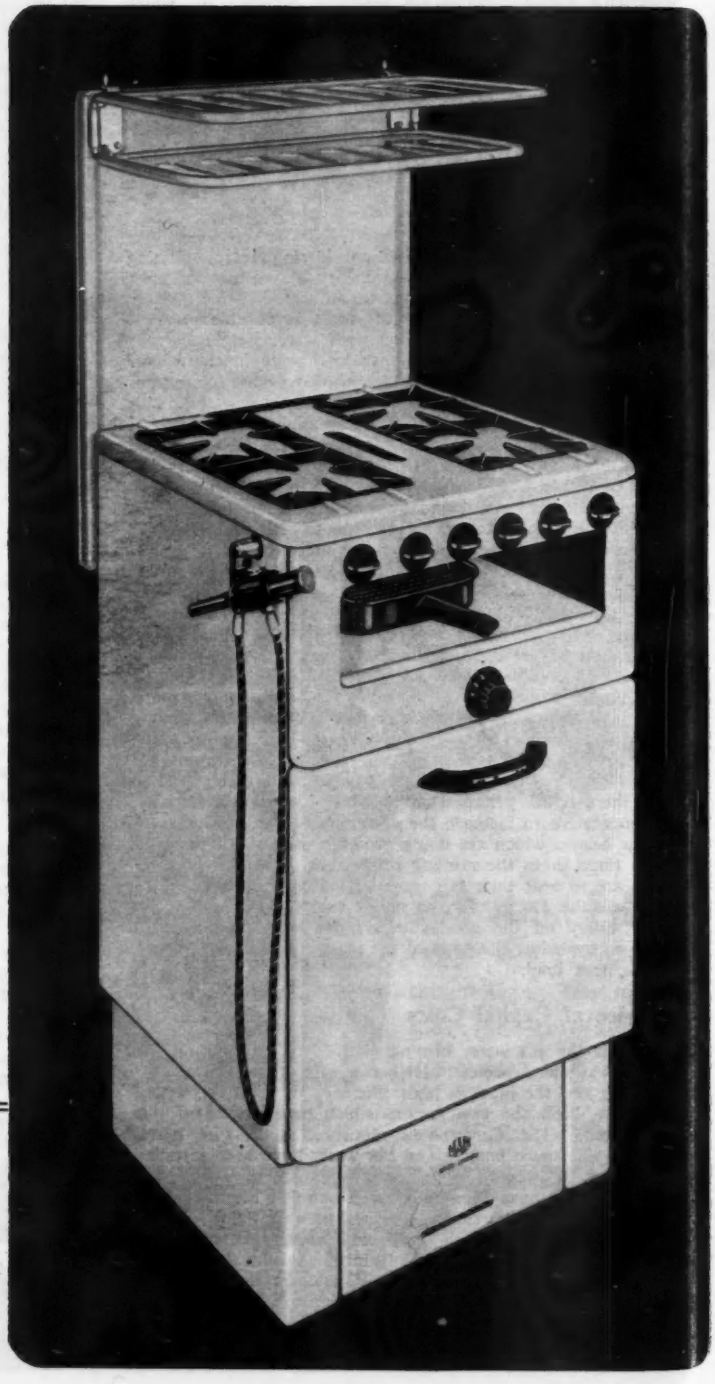
No. 20 CENTURY

The luxury Cooker at a moderate price

PROVIDES A HIGH STANDARD OF PERFORMANCE COMBINED WITH EASE OF MAINTENANCE

The No. 20 Century is of advanced design and constructed primarily of sheet steel. No chassis is used; its great strength and solidity being achieved by the use of large steel panels with deep flanges bolted together.

The overall dimensions of the Cooker are 36 ins. high, 20¾ ins. wide and 20 ins. deep. With back-plate and platerack the height is increased to 53 ins. and the depth to 20¾ ins. overall.



MAIN

R. & A. MAIN LIMITED
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Its roomy oven embodies novel features

The No. 20 CENTURY oven is of large capacity: 17″ wide, 15¼″ deep and 14″ high.

Its single burner is at the back and is bolted to a shield, which makes its removal and replacement very easy. Ignition of the burner is by means of a flash tube from a hole at the front of the oven base. The flue outlet from the oven is at the top, near the front, and the products are finally discharged upwards through a vent in front of the backplate, thus helping to warm anything on the platerack.

This combination of burner and flue system ensures a high standard of cooking performance at minimum gas consumption and enables a large cake tray (13½″x10½″) to be used. It also allows the cooker to be fitted flush to the wall, without risk of staining it.

The thermostat head has a " pull-off " knob and the valve can be removed for inspection or cleaning without disturbing the calibration. Its rod, housed in the flue above the oven crown, cannot be interfered with by the user. This, together with the short embossed runners on the side linings and the large radii at all corners and joints, makes cleaning of the oven interior particularly easy.

The oven shelves are designed to minimise tilting and to ensure correct positioning of the cake tray and the meat tin.

The bottom-hinged door is self-sealing. It has a non-rusting aluminium frame and its counter-balance springs are housed in the plinth base and are easily accessible.

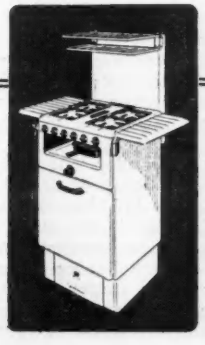
A levelling strip is provided in the plinth base.

Provision is made for fitting a lighter at the left-hand side of the cooker.

Fitted with Hotplate Extensions

IN CREAM Vitreous Enamel

Gas Cooker



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gas industry during this period as to the value of this load, and the peak load generating plant which it is alleged has to be installed on a gas distribution system to meet it. It was, therefore, timely that there should be presented at the Institution of Gas Engineers research meeting last November a masterly paper on 'Effect of Load Variation on Cost'[27] by the Chief Engineer of the North Thames Gas Board which included a clear and lucid analysis of additional costs incurred on production and distribution plant to meet the space heating load. The paper showed that this cost is not so onerous as has been supposed.

It is realised that this question is extremely involved; nevertheless, it is contended that the gas industry is providing a fuel service to both the domestic and the industrial consumer alike and it cannot discriminate or pick and choose the load that it would like to supply. It would indeed be regrettable if the gas industry developed a 'peak load complex.'

Peak Loads

There is no denying that the electric fire is the largest single factor contributing to the peak load problems of that industry. It is estimated that the percentage of domestic consumers having 'electric comfort' heaters has doubled from 1939-51 (33.0% to 66.4%)[28]. A recent Government survey stated that 'the portable electric fire was far more frequently found in the British household than any other form of subsidiary heating apparatus. . . . . 58% of electricity users had one or more of these heaters . . . . this apparatus was not normally used as the main form of heating, but for short period heating and that they tended to be mainly supplementary to the use of coal and not to substitute for it as a space heater'[29]. This same report also states that the amount of space heated for part-days (short period heating) has increased from being 18% of all the space heated in 1942 to 33% of the space heated in 1948, and goes on to draw the natural conclusion that the electric and gas heaters (particularly the portable electric heaters, several millions of which have found their way into households since 1942) were not being used merely to replace coal but tended to be used to provide short-period heating in rooms which would not otherwise be heated[29].

The following statement appeared in a paper 'The Cooking, Water Heating, and Comfort Heating Loads of an Integrated Supply System' by the Deputy Commercial Manager and Chairman, Utilisation Research Committee, British Electricity Authority, at the 1952 British electrical power convention and can be taken to illustrate the lines upon which our competitors are approaching the peak load problems of domestic supplies: 'If the short-lived morning peak could be eliminated, the domestic comfort heating load characteristic could be greatly improved. It would seem, however, that the peak arises from an inherent virtue of electricity used to supply a specific need for which, with present social habits, the only practicable alternative would be the less flexible gas fire, which cannot be as effective for the particular purpose. The answer found by the supply industry in the past to problems of isolated peak loads has not been to seek to curtail the particular load but to develop compensatory loads . . . . The excess morning peak in cold weather would, for instance, lose much of its impact if display and shop window lighting were freed from restriction and the system reverted to an afternoon peak. It seems probable, having regard to the large proportion of consumers already equipped with heating appliances, that the most severe incidence of this particular development has been reached, and that with higher rates of development in other directions its relative significance will gradually decline. No individual type of load, considered in isolation, is ideal from the supply system point of view, but it can surely be said that the domestic load as a whole is a good one, and that the water heating, cooking, and comfort heating components have contributed substantially to the system's steady improvement in load characteristic as they have also contributed to the revenues of industry. Indeed, without the revenue which such loads bring it would be quite uneconomic to give any supply to some of the new housing estates now being built which by their layout require expensive cabling'[31]. This is a somewhat lengthy quotation, but coming from such an eminent authority in the electricity supply industry it is felt that it mirrors the fundamentals upon which the electricity boards will base their sales promotion campaigns that will inevitably follow the lifting of the present restrictions. There is, too, much in this statement particularly in the reference to the peak load and compensating load that could equally apply to our industry. It is a statement of policy of a vigorous and expanding industry determined to grapple and overcome any obstacles which might be placed in the way of its progress.

The Practical Alternative

On the other hand the gas industry has the 'practical alternative' referred to above in the gas fire. The gas fire is an ideal appliance for bedroom heating, but its installation in new housing is often precluded due to (a) the absence of flues apart from the living room, (b) the cheaper capital cost of a portable electric fire which does not need a flue, and can be carried about from room to room. As to (a), notwithstanding the fact that the provision of a flue in the main bedroom was a requirement specified by the Ministry of Health and the recommendation by the Egerton Committee that as one way of ventilating a bedroom whatever the form of heating, a flue should be provided (30 sq. in. or 50 sq. in. where an open fire is installed)[32], very few housing authorities would appear to have installed bedroom flues in post-war houses, which is a complete reversal of pre-war policy, where at least one bedroom was provided with a flue in the houses built in the inter-war years. The elimination of all flues with the exception of one in the living room is a restriction on the potential full use of gas for space heating, and it would seem that this situation is likely to last so long as housing authorities continue to look for savings in terms of shillings in order to reduce the overall cost of the houses they build. One of the answers to this problem may be provided by the balanced flue heater having a high efficiency for a flued appliance and which by reason of its principle of operation does not consume the air in the room and is most suitable for heating bedrooms where no flue has been provided. At the present time purchase tax and fairly limited production make this rather an expensive appliance.

The Convector Fire

The convector gas fire with its improved efficiency, while particularly suitable for long period heating can be used for short periods, does not appear to have received the attention it deserves, and it would seem that further development would be justified in order to increase further its efficiency above the present figure of about 65%[33].

Reference has been made to the Government's policy of stipulating the installation of at least one approved solid fuel fire in houses ranking for subsidy. There are many periods during the autumn and spring—and, indeed, on other occasions during the heating season—when it is unnecessary to light the solid fuel fire. The portable gas fire admirably meets the requirements on these occasions and there is no doubt that there is a considerable potential load here. Unfortunately, when a customer after making a selection of an electric fire in a shop or showroom takes it away it is ready for plugging into a power point so frequently provided in the room, but on purchasing a portable gas fire the customer has to undertake in so many cases the further expense and inconvenience of having a suitable adaptation made so that the fire can be plugged into the existing installation. There is an excellent skirting fitting on the market with provision both for ignition of solid fuel fire and for plugging-in a portable fire. If this fitting could be incorporated in the house carcass instead of only the control for ignition it would materially assist in the sale of these appliances. There is a promising development in the new combined gas and solid fuel fire in which a gas fire is incorporated in the front of a coke fire. It is most regrettable that purchase tax is payable both on the solid fuel as well as the gas component

which goes a long way to nullify its sale at the present time, which is paradoxical in view of the fact that its dual operation on coke and gas conforms with the requirements of the Egerton and Simon committees on the division of the space heating load between gas, electricity, and solid fuel. It is understood that district tests on the appliance are now being carried out by area boards and it is hoped that the industry and the appliance manufacturers will continue to press forward energetically the development of the dual-fuel appliance.

Central Heating

During and since the end of the last war the use of gas for the provision of space heating of factories and commercial premises by means of central heating, warmed air, or radiant heating, or a combination of these systems has increased at a phenomenal rate. This is particularly so in the case of radiant heating (high and low temperature). Gas has the necessary flexibility to meet the varied requirements of this type of load. There is every indication, however, that the industry is about to enter an era of intense competition from other fuels, particularly oil, for this load. Further reference to the increased use of fuel oil is made later on in this paper. There are also signs that our electrical competitors are interested in this load when supplied with off-peak current. One example is floor warming which, by means of electrically heated cables buried in the floor, utilises the floor structure itself as storage, usually only consuming current between 7 p.m. and 7 a.m. This system has been installed in schools, offices, factories, and many other types of building. As an indication of the charges for this off-peak electricity a figure of a little under 0.6d. per kWh has been quoted recently for heating a school[24]. In the area of one electricity board there is a tariff of ¼d. per unit for heating halls and churches between the hours of 7 p.m. and 7 a.m. on week-days and 1 p.m. Saturdays to 7 a.m. Monday at week-ends.

(To be continued)

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BACKS TO THE WALL — Concluded from p. 95

hundred and one matters which concern every day gas production and works organisation, and thus pool both knowledge and experience for the benefit of the Area as a whole.

DISCUSSION

Mr. J. W. Denton, G.M. (Chairman of the Section), said he was glad that Mr. Dent had disregarded his injunction to present the paper in summary because he realised that it would have lost much of its value if it had been curtailed. It was full of small but important points and he congratulated him on the care and attention with which he had dealt with details.

Mr. O. H. W. Boonham (Cheltenham) recalled that he had been present when the paper was first presented at the area conference at Moretonhampstead in 1951. It was a paper that should be read and re-read and he hoped that when it was published it would be studied by a wider audience of gas engineers.

Mr. W. Morland Fox (W. J. Jenkins & Co., Ltd.) said the fact that he himself had chosen the title 'Preventive Maintenance' for his recent paper to the London and Southern Section of the Institution was entirely fortuitous; he congratulated Mr. Dent on putting across in a few minutes what had taken him 40 minutes to read. Each of the many subjects raised in Mr. Dent's paper might well be the subject of a major communication. His reference to the ratio of labourers to craftsmen was important, and he hoped the South Western Gas Board would take due notice of his plea for effective maintenance of works as a means of cutting down labour costs. The cost of breakdowns was out of all proportion to the cost of maintenance, and having listened to Mr. Dent's paper he was confirmed in his view that 'preventive maintenance' was a term that met the whole problem. The author had deprecated 'water-tight compartments,' but they were inevitable in a large organisation. He agreed, however, that a determined attempt to split a large organisation into water-tight compartments was a mistake, and liable to result in some loss of interest.

Mr. D. W. G. Scott (Bristol) heartily endorsed Mr. Dent's plea for day-to-day attention to cleanliness on the works, and he referred to a works where there was an arrangement with the corporation cleansing department to send road sweeping equipment regularly for the purpose of keeping the place tidy. Mr. Dent's paper was really a counsel of perfection, and it would seem that all the station engineer had to do was to take the paper and run the works on the lines there laid down, but unfortunately there were difficulties, and one of those difficulties was the labour situation, on which Mr. Dent had not said a great deal. In order to get one man at present they had to engage six or seven in the hope that out of the total they would find one with sufficient interest to stay and do the work. The key men—the engine drivers and so on—were the backbone of the works, the men on whom they had relied in the past. Nowadays it was not easy to get such men; so many did not have sufficient interest to stay long enough to settle down.

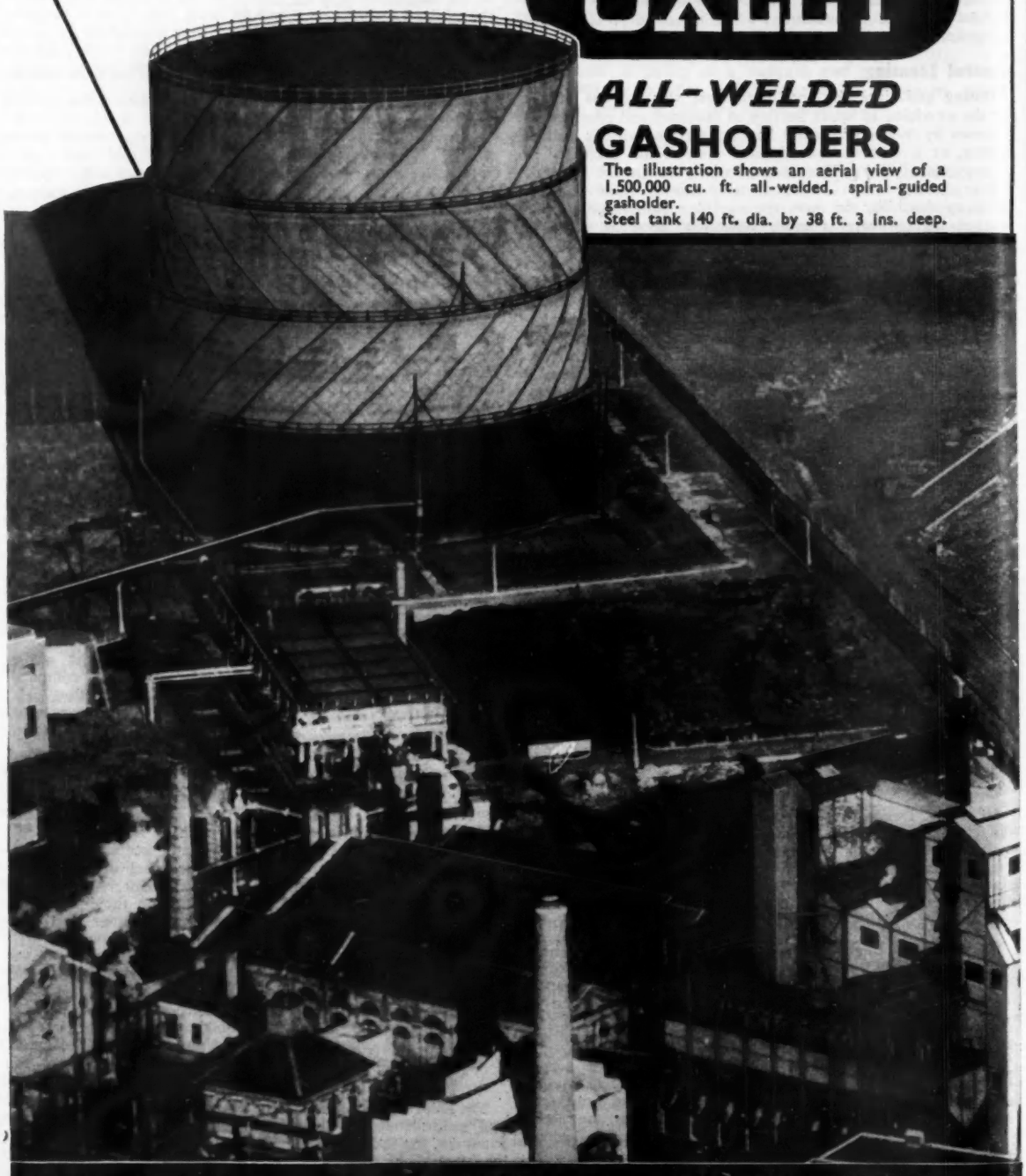
Mr. Dent briefly replied to the points raised in the discussion and paid tribute to the usefulness of Mr. Morland Fox's paper to the London and Southern Section. He welcomed the suggestion about engaging a corporation road sweeper to keep the works clean and said he was coming to the conclusion that it was not a good thing for the Board to run its own transport. When they had their own transport the tendency was to use it; whereas they might economise by employing nationalised transport.

On the proposition of **Mr. C. R. Ingham** a vote of thanks was accorded to Mr. Dent for his paper.

OXLEY

ALL-WELDED GASHOLDERS

The illustration shows an aerial view of a 1,500,000 cu. ft. all-welded, spiral-guided gasholder.
Steel tank 140 ft. dia. by 38 ft. 3 ins. deep.



OXLEY ENGINEERING CO. LTD., HUNSLET, LEEDS 10

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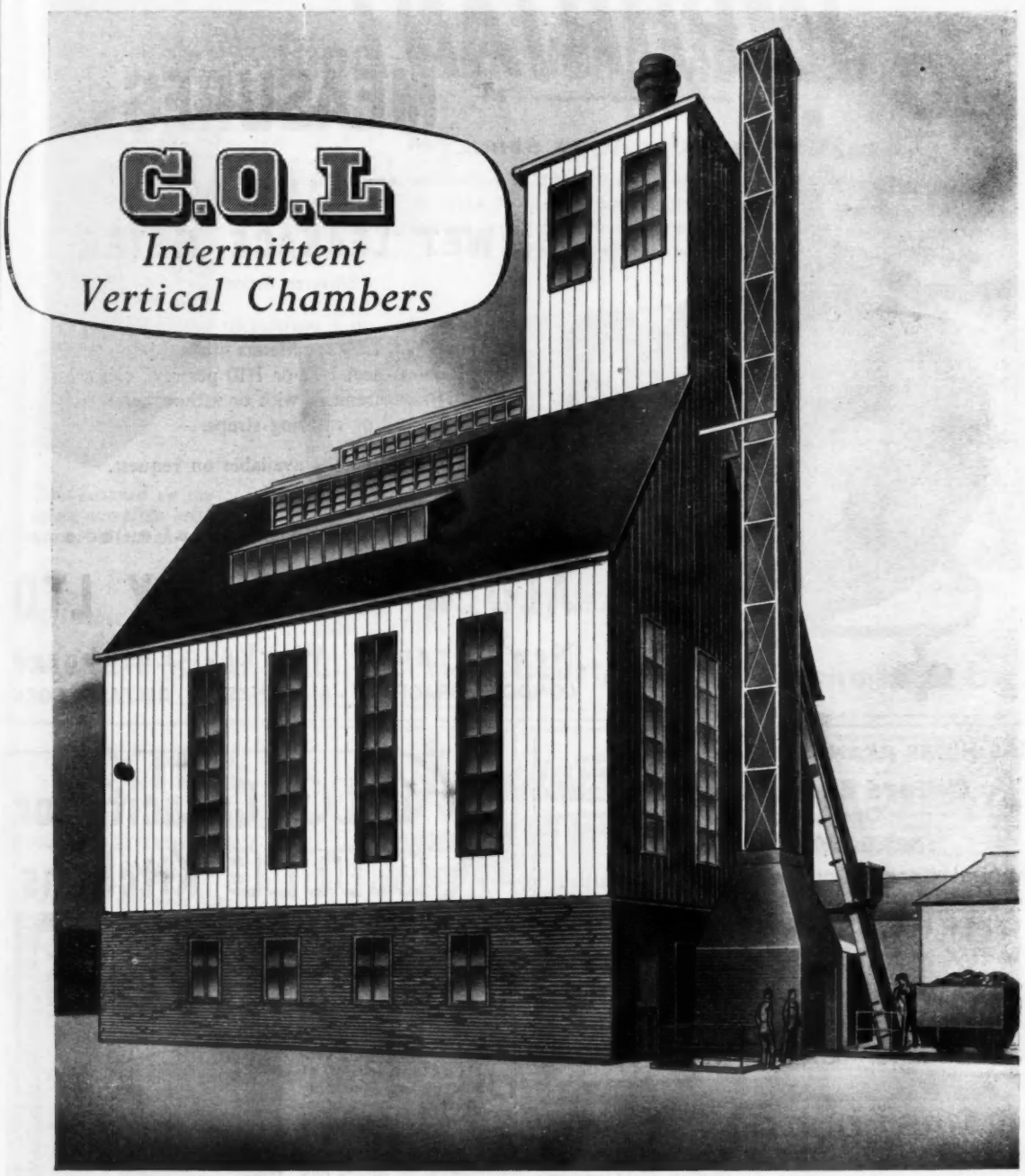
Telegrams : Oxbros, Leeds 10

London Office : WINCHESTER HOUSE, OLD BROAD STREET, E.C.2.
Telephone : London Wall 3731 Telegrams : Asbengpro, Stock, London

W.131



An artist's impression of the C. O. L. Intermittent Vertical Chamber installation for the Northern Gas Board at Spital Works, Berwick-on-Tweed.

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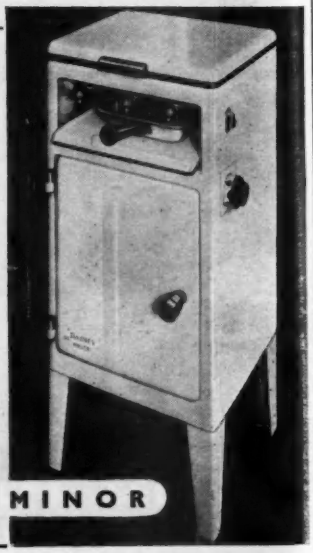

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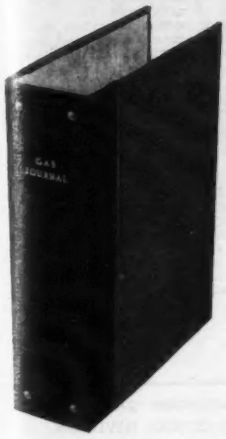

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FOR SALE—Eight Self-sealing MOUTHPIECES with lids and crossbars complete, size 21 in. × 15 in., 16 in. deep, all sockets for 6 in. bore ascension pipes. Any or all of these may be purchased. Apply: No. 147, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

NORTHERN GAS BOARD

WESTERN GROUP

DISTRIBUTION FOREMAN

APPLICATIONS are invited for the post of DISTRIBUTION FOREMAN, Workington Unit. Applicants should hold the City and Guilds Certificate in Gas Fitting and must be experienced in installation work, modern gas appliances, estimating and mainlaying. It would be of advantage if qualified to drive a motor vehicle.

Rate of pay in accordance with Intermediate Grade VI, conditions 2 (£450-£495 per annum). A house at reasonable rental will be available.

Applications stating age, training, qualifications and experience together with *copies* of two recent Testimonials should reach the Group Chief Engineer, Gas Works, Workington, not later than April 15, 1953.

A. R. CROFT,
Group General Manager.

NORTHERN GAS BOARD

WESTERN GROUP

ENGINEERING ASSISTANT (DIVISIONAL)

APPLICATIONS are invited for the post of ENGINEERING ASSISTANT (DIVISIONAL) for the Workington Division.

Applicants should be experienced in Manufacture and Distribution of gas. Mechanical experience will be an advantage.

The salary will be in accordance with Grade VII (£545-£625 per annum) of the National Salary Scales. A house at a reasonable rental is available.

The successful applicant may be required to pass a medical examination and will be subject to the provisions of the Board's Staff Pension Scheme.

Applications stating age, training, qualifications and experience together with names of two referees should reach the Group Chief Engineer, Gas Works, Workington, not later than April 15, 1953.

A. R. CROFT,
Group General Manager.

(*Classified advertisements continued on Supplement 4*)

APPOINTMENTS VACANT (ctd.)

SCOTTISH GAS BOARD
VALE OF LEVEN DISTRICT
DISTRIBUTION AND SALES OFFICER

APPLICATIONS are invited for the above position at a salary within A.P.T. Grade V, *i.e.*, £460-£540 per annum.

Candidates should be experienced in all branches of gas distribution and in the sales of domestic gas appliances.

The post is superannuable and the successful applicant may be required to pass a medical examination.

Applications, stating age, qualifications and experience together with the names of two referees, should reach the undersigned within fourteen days of the appearance of this advertisement.

T. A. ROWAN,
District Manager.

Gas Offices,
57, North Street,
Alexandria,
Dumbartonshire.

SCOTTISH GAS BOARD
GLASGOW DIVISION
GLASGOW DISTRICT
TECHNICAL ASSISTANT—
INDUSTRIAL SECTION

APPLICATIONS are invited from suitably qualified persons for the post of TECHNICAL ASSISTANT in the Industrial Section of the Glasgow District.

The salary will be in accordance with Grade A.P.T. VII (Provincial 'A'—£545 to £625 per annum) and the initial placing on the Scale will be according to experience and qualifications.

Candidates should have knowledge and experience of Draughtsmanship and the uses and application of Gas in Industrial Furnaces, etc.

The post is superannuable and the successful candidate may be required to pass a medical examination before being appointed.

Applications, stating age, training, qualifications and experience should reach the undersigned not later than fifteen days after the appearance of this advertisement.

D. F. YOUNG,
Divisional Controller.

Glasgow Division,
30 John Street
Glasgow C.1.

SCOTTISH GAS BOARD
NORTHERN DIVISION
APPOINTMENT OF MANAGER
TO WICK DISTRICT

APPLICATIONS are invited for the position of MANAGER of the Wick District Gas Undertaking.

Applicants must be adequately qualified and experienced in modern Gas Works and Distribution practice, in the operation and control of Horizontal Retorts and Water Gas Plants, and in the supervision and administration of a medium sized Undertaking.

The salary will be on Scale Provincial 'B' Grade VI (£475-£555) with free house, fuel and light.

The successful candidate will require to pass a medical examination and will be subject to the provisions of the Board's Superannuation Regulations.

Applications giving full particulars of age, qualifications and experience, together with *copies* of three recent Testimonials, should be lodged with the undersigned within fourteen days of the appearance of this advertisement.

H. S. MILNE,
Divisional Controller.

50, Cotton Street,
Aberdeen.
March 27, 1953.

SCOTTISH GAS BOARD
WESTERN GROUP
PAISLEY DISTRICT
APPOINTMENT OF
WORKS SUPERINTENDENT

APPLICATIONS are invited from suitably qualified persons for the appointment of WORKS SUPERINTENDENT in the Paisley District Gas Undertaking.

Applicants must be thoroughly trained and have had practical experience in the control of a large Gas Works, including the repair and maintenance of carbonising and mechanical plant.

Candidates should hold the Higher Grade Certificate (Engineering) of the Institution of Gas Engineers, or equivalent in Mechanical or Electrical Engineering.

The salary will be in accordance with Grade IX, Provincial 'A' of the National Salary Scales, with placing according to experience and qualifications.

A suitable house is available.

The successful applicant will be required to pass a medical examination and to subscribe to the Board's Superannuation Scheme.

Applications stating age, training, experience and qualifications, accompanied by *copies* of two recent Testimonials, should be lodged with the undersigned not later than Wednesday, April 15, 1953.

DANIEL MARSHALL,
Deputy Engineer & Manager.

Paisley District Office,
27, McKenzie Street,
Paisley.
March 30, 1953.

SCOTTISH GAS BOARD
FIFE GROUP
DUNFERMLINE DISTRICT

APPLICATIONS are invited for the following vacancies in the above District.

(1) TECHNICAL ASSISTANT

Candidates should state age, particulars of training, experience and qualifications.

The salary will be up to Provincial 'A' Grade VII, maximum of which is £625 with placing according to experience and qualifications.

(2) DRAUGHTSMAN/TECHNICAL ASSISTANT

Candidates should state age, technical qualifications, giving full details of previous Engineering and Gas Works experience and should be a good draughtsman.

The salary will be up to Provincial 'A' Grade V, maximum of which is £540 with placing according to experience and qualifications.

Both positions are in the Superannuation Class and will be subject to such Superannuation regulations as may in due course be introduced. Medical examination may be required.

Applications to be sent in to reach the undersigned not later than April 17, with *copies* of Testimonials or the names of two referees.

DAVID L. DICKSON,
Group Manager.

Gas Works,
Grange Road,
Dunfermline.
March 23, 1953.

WEST MIDLANDS GAS BOARD
WARWICKSHIRE DIVISION—
COVENTRY DISTRICT
TECHNICAL ASSISTANT—DISTRIBUTION

APPLICATIONS are invited for the above position, the salary for which will be within Grade VI (£490-£570 per annum) of the National Salary Scales for Gas Staffs.

Candidates should have received practical experience in Mains and Service work, both low and high pressure.

The post is superannuable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience together with the names of two referees, should be addressed to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD
WARWICKSHIRE DIVISION
TECHNICAL ASSISTANT—
LEAMINGTON SPA DISTRICT

APPLICATIONS are invited for the above position at a works having a production capacity of 5 million cubic feet of gas per day.

Candidates should hold the higher grade Certificate in Manufacture of the Institution of Gas Engineers. They should possess practical experience of the operation of Vertical Retort Installations, C.W.G. plant and normal gas works ancillaries, and should be experienced in carrying out all usual gas works tests.

The salary will be within Grade VII of the National Salary Scales for Gas Staffs (£545 × £20—£625 per annum). The post is superannuable and the successful candidate will be required to pass a medical examination.

Applications stating age, qualifications and experience, and giving the names of two referees, should be addressed to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD
WORCESTERSHIRE-HEREFORDSHIRE
DIVISION
TECHNICAL ASSISTANTS—MALVERN
AND HEREFORD DISTRICTS

APPLICATIONS are invited for the above positions, the salaries for which will be within Grade V (£460-£540 per annum), of the National Salary Scales for Gas Staffs.

Candidates should have received a good general training in Gas Manufacture and be capable of carrying out routine chemical tests and have had experience in the control of plant.

Preference will be given to Applicants holding a certificate of the Institution of Gas Engineers in Gas Engineering (Manufacture).

The posts are superannuable and the successful candidates will be required to pass a medical examination.

Applications stating age, qualifications and experience, together with the names of two referees, should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Worcestershire-Herefordshire Division, 12, St. Nicholas Street, Worcester, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

GAS ANALYST and a TRAINEE GAS ANALYST required by Kent Oil Refinery, Ltd., Isle-of-Grain, Kent. Applicants for the former should be between 25-40 years of age, and should have had previous experience in this type of work, but specialised training will be given to the successful candidate. Applicants for the latter should be between 21-25 years of age and should have had some laboratory experience. Applicants for both these vacancies may be either male or female. Progressive salary, canteen facilities and pension scheme. Write stating age, experience to BOX G.J.166, *c/o* 191 Gresham House, E.C.2.

SOUTH EASTERN GAS BOARD
WEST SURREY DIVISION
RELIEF SHIFT SUPERINTENDENT,
WANDSWORTH

EXPERIENCE required in control of gas works plant. Successful applicant will work a six-shift week and be responsible for operation of station during absence of normal day staff.

Salary within the range £615-£695 per annum.

Applications in writing quoting reference V10/313 and giving full details should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SOUTHERN GAS BOARD
WESTERN DIVISION

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at the Poole Works of the Bournemouth Undertaking.

Applicants should have passed the Higher Grade (Manufacture) examination of the Institution of Gas Engineers, and have had a general Gas Works training. Experience in the control of continuous vertical retorts and automatic water gas plants will be an advantage.

Salary will be in accordance with Grade V-VII (Provincial 'A') subject to qualifications and experience.

Applications, stating age, qualifications and experience, together with two references should be received by the undersigned on or before April 18, 1953.

J. C. HOGG,
General Manager.

Bournemouth Gas Undertaking,
136, Old Christchurch Road,
Bournemouth.

WALES GAS BOARD
MECHANICAL ENGINEER

APPLICATIONS are invited for the position of MECHANICAL ENGINEER on the Headquarters Staff of the Wales Gas Board.

Duties will include the design and costing of schemes for the economical application of all customary forms of power, including steam, electricity and internal combustion engines, and the preparation of estimates for, and supervision of, the work of installing, dismantling and repairing gas works' plant throughout the Board's area which is carried out by a staff of some thirty Mechanical Fitters and Erectors under the Mechanical Engineer's control.

The work covers all types of gas works' plant, but practical experience in the construction and repair of gasholders will be a desirable qualification.

The commencing salary will be in the region of £900 per annum, in accordance with qualifications and experience.

The successful candidate will be required to pass a medical examination and to join the Board's Superannuation Scheme.

Applications, stating age, qualifications and experience accompanied by the names of two referees, should reach the undersigned not later than April 25, 1953.

C. B. MAWER,
Secretary

Wales Gas Board,
1 & 2, Windsor Place,
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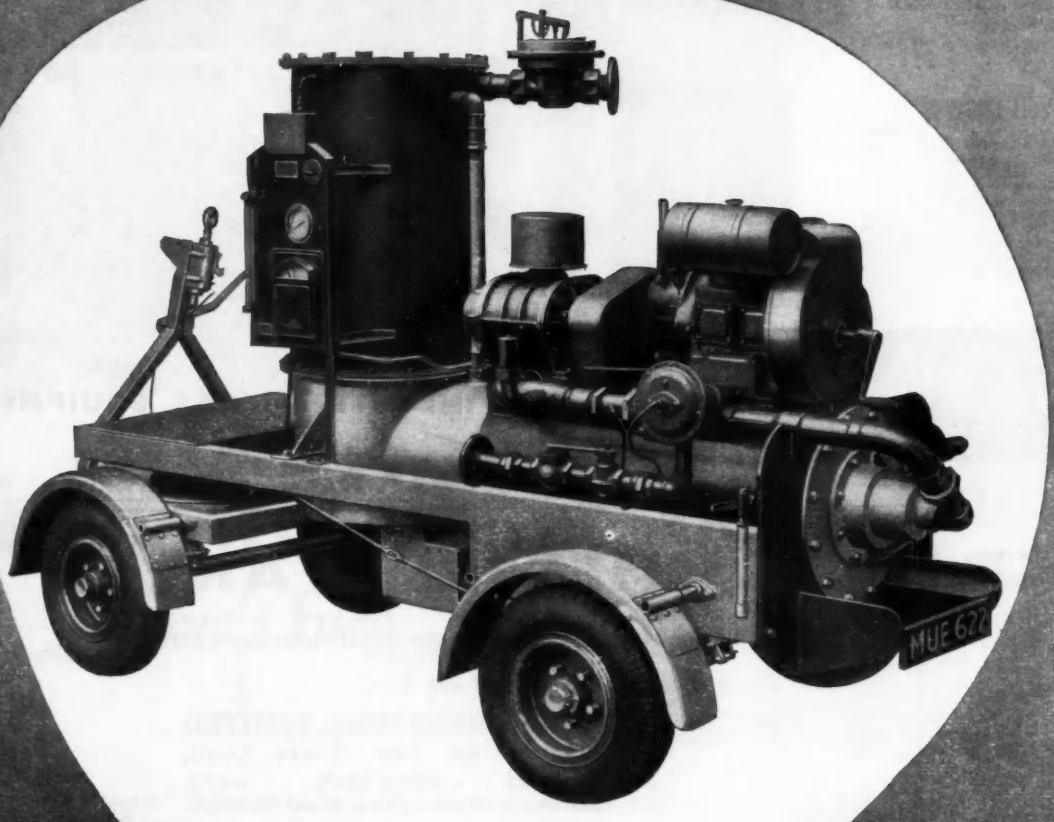

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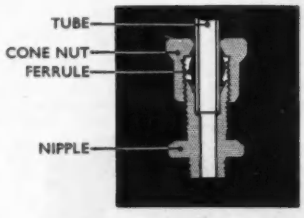
FOR COMPRESSING AIR OR GAS SUPPLIES USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS, ETC.

DIRECT COUPLED COMPRESSORS (see illustration right) *are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7¼".*
CAPACITY RANGE: *100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.*

TYPE 4 COMPRESSORS (not illustrated) *are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.*
CAPACITY RANGE: *500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.*
AREA OCCUPIED: *from 9¼" x 16½" to 61" x 27".*

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. *Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.*



serving to burn

Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner *with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies.*
Size Range: *1", 1¼", 1½", 2" and 2½" outlets.*
Capacity Range: *45-280 cub. ft. of gas per hour.*

Brass non-blow-off head types: *deal with 5 to 10 cub. ft. of gas per hour.*

Stainless steel, "F" type head, burner: *deals with 8 cub. ft. of gas per hour.*

Perforated head type burner: *deals with 10 to 15 cub. ft. of gas per hour.*

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'Phone: Tottenham 4112 (twelve lines) 'Grams: "Keithblac, Norphone, London"
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INDUSTRIAL GAS EQUIPMENT

524/5/G

SCRAP GAS METERS WANTED

Top prices paid—Collection arranged from anywhere in U.K.

Sell to those best suited to deal with them.

Sell to — MITCHAM SMELTERS LIMITED
Rometal Works, Red House Road,
Mitcham Road . . . CROYDON . . . Surrey.
Tel: THOrnton Heath 6101. (Private Branch Exchange).

Truck Loads to our own private siding, Beddington Lane, Southern Region.

Plenty to Spare...

During the past few months, considerable re-organisation of our works has taken place; production is planned on an entirely new basis, with the result that output is increasing. This is particularly so with fittings, and deliveries can be made from stock as shown.

Your orders will be dealt with promptly and efficiently

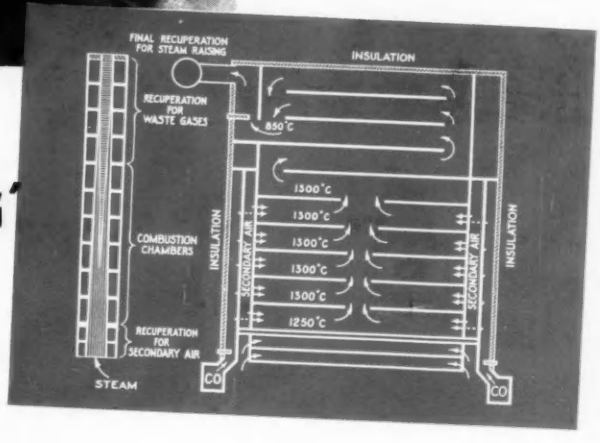
BARREL NIPPLES. Full range of sizes from ⅛in. to 6in. Black or galvanised.

No 23

RUSSELL BROS (WALSALL) LIMITED
BRADFORD TUBE WORKS · WALSALL

TRADE MARK

Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C.4. Wednesday, April 8, 1953



'BALANCED HEATING' saves fuel

"Balanced Heating", a feature of the Glover-West continuous vertical system of carbonization, reduces fuel consumption to a level hitherto unobtainable. In the "Balanced Heated" setting, producer gas enters the combustion chambers from *both* sides and retorts are evenly heated by *primary* combustion. Combustion proceeds towards the centre of the setting, heat transmitted to the outer walls being recovered in the producer gas and air uptakes and returned to the system. Control of temperature in individual combustion chambers gives greater flexibility—an important factor today when many different coals are handled by one plant.

★*Illustration shows a "Balanced Heated" setting under construction*

West's Gas IMPROVEMENT CO. LTD.

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Telephone: COLlyhurst 2961. Telegrams: Stoker, Manchester.

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